



Reproduced from Photo. by A. P. Low, 1894.

GRAND OR MCLEAN FALLS, HAMILTON RIVER.

GEOLOGICAL SURVEY OF CANADA
G. M. DAWSON, C.M.G., LL.D., F.R.S., DIRECTOR

REPORT

ON EXPLORATIONS IN THE

LABRADOR PENINSULA

ALONG THE

EAST MAIN, KOKSOAK, HAMILTON, MANICUAGAN

AND

PORTIONS OF OTHER RIVERS

IN

1892-93-94-95

BY

A. P. LOW, B. AP. SC.



OTTAWA

PRINTED BY S. E. DAWSON, PRINTER TO THE QUEEN'S MOST
EXCELLENT MAJESTY
1896

To

GEORGE M. DAWSON, C.M.G., LL.D., F.R.S.,

Director Geological Survey of Canada.

SIR,—I have the honour to submit herewith a report of my work in the Labrador Peninsula during the seasons 1892, 1893, 1894 and 1895.

I have the honour to be,

Sir,

Your obedient servant,

A. P. LOW.

NOTE.—All bearings mentioned in this Report refer to the true North. The magnetic variation at the mouth of the East Main River is 17° west and increases as the river is ascended till at Lake Nichicun it is nearly 30° west. From Nichicun to Fort Chimo the variation increases gradually to 45° west at the latter place. At the mouth of the Hamilton River the variation is 38° west, and along the river it ranges between 30° and 38° west, while along the Romaine River it is about 30° west, and at Lake Mistassini about 20° west.

REPORT

ON

EXPLORATIONS IN THE LABRADOR PENINSULA

ALONG THE
EAST MAIN, KOKSOAK, HAMILTON, MANICUAGAN AND
PORTIONS OF OTHER RIVERS.

INTRODUCTORY.

The present report is based mainly upon the observations made along the routes of exploration followed during the seasons of 1892, 1893, 1894 and 1895. The knowledge so gained has been supplemented by information obtained from officers and servants of the Hudson's Bay Company, Indians, and other persons acquainted with the Labrador Peninsula. Free use has also been made, in regard to certain subjects, of the information to be found in the writings of Mr. Lucius M. Turner,* Dr. A. S. Packard,† and Mr. W. A. Stearns,‡ who have all spent some time on the southern and eastern coasts and there collected much valuable information relating to the history, physical geography and natural history of those regions. Observations on the natural resources of the peninsula made by officers of the Geological Survey in former explorations, have also, when necessary, been incorporated in the text; a list of these explorations is given at the end of the historical notes.

Acknowledgments are due to Mr. C. C. Chipman, Commissioner of the Hudson's Bay Company, and to Mr. Peter McKenzie, for circular letters to the various officers in charge of posts along the routes travelled, and to the following gentlemen in charge of these posts: Messrs. J. Broughton, D. Mathewson, Wm. Scott, C. Sinclair, J. A. Wilson, A. Nicholson, H. M. S. Cotter, John Ford, J. Fraser, J. Gordon, W. Miller, J. Iserhoff and J. Corson, for their generous hospitality, valuable information and efficient aid, to which the success of the explorations has been largely due.

* List of birds of Ungava, Proc. U. S. Nat. Museum, VIII., 1885.
Ethnology of Ungava, Annual Report U. S. Bureau of Ethnology, 1889-90.
† The Labrador Coast, New York, 1891.
‡ Labrador, Boston, 1884.

Acknowledg-
ment of assist-
ance.

Work of
assistants.

During the season of 1892, Mr. A. H. D. Ross, M.A., acted as my assistant and besides carrying out other varied duties, made a large collection of plants, which added greatly to the botanical knowledge of the eastern watershed. The names of these plants have been included in the list given in an appendix. In 1893, 1894, and 1895, Mr. D. I. V. Eaton, C.E., acted as assistant and topographer, and it is entirely to his careful work that the exact surveys of these years are due. Mr. Eaton, since his return to Ottawa, has also compiled the map which accompanies this report.

Previous
reports.

Itineraries of the various journeys made in the course of these explorations have been printed in the Summary Reports of the Geological Survey Department for 1892, 1894, and 1895, and only a brief outline of the routes followed need in consequence be given here.

Route fol-
lowed in 1892.

In 1892, the routes traversed were from Lake St. John, up the Chamouchouan River to its head, thence north-east through three large lakes to Lake Mistassini. From that lake the east channel of the Rupert River was descended some fifty miles, to a portage-route crossing through small lakes to the East Main River fifty miles northward. This stream was carefully surveyed downward for three hundred miles to its mouth on the east side of James Bay. James Bay was crossed to Moose River, and that stream ascended to its head, where the Canadian Pacific Railway was reached, making in all a canoe trip of over thirteen hundred miles. In 1893 and 1894, the party remained in the field during the winter. A start was again made from Lake St. John, and the chief branch of the Chamouchouan River was ascended to its head near Lake Mistassini. The same route as that followed the previous year, was taken to the East Main River, where the survey was commenced at the end of that year's work, and carried upward to the head of the river, where a crossing was made to the upper waters of the Big River, and that stream was descended to Lake Nichicun. A portage-route was then followed to Lake Kaniapiskau, and the Koksoak River, which flows out of it, was descended to its mouth at Ungava Bay. In this manner a canoe trip through the centre of the Labrador Peninsula from south to north was accomplished. From Fort Chimo, the Hudson's Bay Company's steamship "Eric" was taken to Rigolet on Hamilton Inlet. From Rigolet, canoes were taken to Northwest River, at the head of the inlet, where the early winter was passed. From the 19th January to the middle of May, the whole time was employed in hauling the outfit, canoes and provisions on sleds up the Hamilton River as far as the Grand Falls, some two hundred and fifty miles above the mouth of the river. The months of June and July were occupied in the

Route fol-
lowed in 1893
and 1894.

exploration of the Ashuanipi branch of the Hamilton River to within a hundred miles of Lake Kaniapiskau, and with the exploration of Lake Michikamau. In August a start was made for the coast by ascending the Attikonak branch of the Hamilton River to its head, and thence crossing to the Romaine River. This stream was descended to within one hundred miles of the coast, whence a portage-route was followed to the St. John River, and by way of this river the Gulf of St. Lawrence was reached. The total mileage of travel for 1893-94 was 5460 miles, made up as follows:—In canoe, 2960 miles; on vessel, 1000 miles; with dog-teams, 500 miles; and on foot, 1000 miles.

The summer of 1895 was spent in exploring the Manicouagan River, flowing southward into the Gulf of St. Lawrence, which it enters about 240 miles below Quebec. This stream was geologically explored to the head of Mouchalagan Lake, where the surveys previously made by the Crown Lands Department of Quebec ended. Above this lake the main stream was surveyed, by micrometer, to its head in Summit Lake in latitude 53° N., and track-surveys were carried over portage-routes on various branches of this river and the head-waters of the Outardes River and of the Big River of Hudson Bay. In so doing a good idea was obtained of the country about the central watershed of the peninsula, as well as considerable additional information in regard to the geology and natural history of the region.

The subject matter of this report is separated into two parts.—The first contains a general summary of the observations made, and the conclusions reached from these. It is consequently more concise and readable than the other part, which consists of detailed descriptions of the routes, the rocks noted, and other observations for the use of future explorers in the regions traversed. In the part relating to the geology, a summary of the chief observations and deductions is given in connection with each formation, before the detailed observations are entered upon.

In the Appendices will be found lists and short notes on the mammals, birds, fishes and insects known to exist in the interior of the peninsula; also a complete list of plants of Labrador, compiled by Mr. J. M. Macoun, from the various collections made by members of the staff of the Geological Survey and others. A meteorological record for 1893-94 is also given in Appendix VII.

Previous Discoveries and Explorations.

The first European authentically known to have visited the eastern shores of America was Biarne, the Norseman, who, in 990, sailed

Route followed in 1895.

Arrangement of matter.

Appendices.

Biarne.

south-east from Greenland, and skirting the shores of Labrador and Newfoundland, proceeded southward probably as far as Nova Scotia.

Leif. In 1000, Leif, the son of Eric the Red, the first settler in Greenland, followed Biarne's track and landed on the coast of Labrador, which, from its desolate rocky coast, he called Helluland, "Strong Land."

Latest Norse voyages. Following Lief came several expeditions of these hardy Norse navigators, who passed southward to "Vineland the good." The latest Norse voyage was in 1347, after which date knowledge of the American continent was lost for nearly one hundred and fifty years.

Szkolney. According to Humboldt, Szkolney, a Pole, is said to have made a voyage to Greenland and Labrador in 1476.

Basque fishermen. About this time, or shortly afterwards, the Basque fishermen, in search of whales, crossed the Atlantic to the shores of Labrador and Newfoundland, and appear to have been met there by the Cabots and Cortereal.

John Cabot. In 1497, John Cabot from Bristol, in search of a western passage to Cathay, sighted the coast of Labrador or Newfoundland. In the following year, his son, Sebastien Cabot, sailed from England and skirted the whole Labrador coast to beyond Cape Chidley, where he turned southward past Newfoundland, Nova Scotia and New England in hope of finding a passage to the eastward.

Cortereal. Cortereal, who sailed from Lisbon in 1500, reached Newfoundland, proceeded thence northward, and probably re-discovered Greenland.

Brest. In 1504, the town of Brest was founded by the French on Bradore Bay, near the Strait of Belle Isle. In 1517, fifty vessels called here, and in the height of its prosperity, about 1600, Brest contained two hundred houses and a population of about 1000 persons.

St. Lawrence. Denis, of Honfleur, and Aubert, of Dieppe, are said to have explored the St. Lawrence as far as the Saguenay in 1503 and 1508.

Labrador. A Portuguese map of 1520, has the name "Lavrador" applied to Greenland, while the unseparated coasts of Labrador and Newfoundland are called "Bacalhaos" or codfish in the Basque tongue. The name Labrador is derived from the Portuguese word for labourer, and was given to the coast because Cortereal brought home a cargo of natives as slaves.

Jacques Cartier. In 1535, Jacques Cartier explored the Gulf and River St. Lawrence as far as Hochelaga, and wintered at Quebec. The Saguenay River was examined by Roberval in 1543.

Mercator's map of 1569, shows the coast of Labrador and Ungava Bay, or Hudson Bay; and as his information was obtained from Portuguese sources, it is evident that the fishermen of that country had previously penetrated Hudson Strait. Mercator's map.

In 1577, Martin Frobisher sighted the northern coast of Labrador, in about latitude 58°, and thence sailed northward a short distance into Hudson Strait. Martin Frobisher.

The cod fishery of Labrador and Newfoundland had grown so rapidly that in 1578, 150 French, besides 200 vessels of other nations, were engaged in this industry, together with thirty Biscayan whalers. Fisheries.

In 1586, John Davis passed along the Labrador coast and discovered two openings, Davis Inlet, in latitude 56° N. and Ivutoke (Hamilton) Inlet in latitude 54° 30' N. John Davis.

Hudson Strait was penetrated to Ungava Bay, or Hope's Advance, Weymouth by Weymouth in 1602.

In 1603, Champlain established the first permanent settlement on the St. Lawrence, at Quebec, a small trading post having been built in 1600 at Tadoussac. Champlain.

Henry Hudson, in 1610, passed through the straits and wintered in the southern part of the bay which bears his name. The following spring he was cast adrift, off the east coast, by his mutinous crew. Henry Hudson.

In the following year, a ship was sent to his rescue under command of Sir Thomas Button, who entered Hudson Strait by a narrow channel south of Cape Chidley, crossed the bay, and wintered at the mouth of the Nelson River. Sir Thomas Button.

About the year 1630, the town of Brest and four leagues of coast on each side was granted to a noble named Courtemanche, who had married a daughter of Henry IV.; and the Eskimo, who had given the French much trouble, were expelled from the Gulf shores about the same time. Eskimo expelled from the Gulf of St. Lawrence.

The quest of the north-west passage brought out James and Fox, in 1631, to Hudson Bay, where James wintered on Charleton Island. James and Fox.

In 1641, the missionary, Jean de Quen, ascended the Saguenay and discovered Lake St. John.

The Sovereign Council of Quebec, in 1656, authorized Jean Bourdon to make discoveries in Hudson Bay. He proceeded there, took possession in the name of the French King, and made treaties of alliance with the Indians. Jean Bourdon.

In 1658, a lease of exclusive trading, hunting and fishing privileges was given by the King of France to Sieur Demaure. This lease Le Traité de Tadoussac.

was called "Le Traité de Tadoussac," and the territory to which it applied was called the King's Domain. It extended along the St. Lawrence from Isle aux Coudres to a point two leagues below Seven Islands, and included the country northward to the heads of the rivers draining into the St. Lawrence. The trading stations established in this territory were called "Postes du Roi," or King's Posts. The lease passed to the "Compagnie des Postes du Roi," and was renewed every twenty-one years. After the cession of Canada, the lease was continued in the same manner by the English government. When it was renewed by the Hudson's Bay Company, in June, 1842, for another term of twenty-one years, the Crown reserved the right to subdivide the country into townships for purposes of settlement. The Hudson's Bay Company's lease was ended by limitation in 1859.

Père Dablon. In 1661, Père Dablon, a Jesuit, and Sieur de Vallière were ordered by d'Argenson, at that time Governor of Canada, to proceed to the country about Hudson Bay. They went there apparently by way of the Saguenay and Rupert rivers. Subsequently, the French company, in their dispute with the Hudson's Bay Company, claimed that they had at that time erected a small post at the mouth of the Rupert River for trade with the Indians, who had asked at Quebec that a missionary and traders be sent among them.

Sieur de la Couture. In 1663, the Indians from about Hudson Bay again returned to Quebec to renew their former request for traders, and Sieur de la Couture, with five men, proceeded overland to the bay, took possession in the King's name, noted the latitude, planted a cross and deposited His Majesty's arms, engraved on copper, at the foot of a large tree. In the same year, Sieur Duquet and Jean L'Anglois also visited the bay, and set up the King's arms by orders of d'Argenson.

Radisson and Chouart. In 1667, Radisson and Chouart *dit* Groseilliers ascended to Lake Superior, and thence crossed to Hudson Bay. They returned to Quebec, and proposed to the merchants to conduct ships to Hudson Bay, but, their proposal being rejected, they went to Paris, where they met with no better success. From Paris they were sent by the British ambassador to London, where their proposal was well received by certain merchants. In 1668, a small vessel was fitted out under command of Zachray Gilham, who, accompanied by the two Frenchmen, sailed to the southern part of the bay, and wintered in a small building called Fort Charles, at the mouth of the Nemiskaw, or Rupert River.

Hudson's Bay Company. In 1669, on the return of Gilham to London, Prince Rupert and others applied to King Charles II. for a charter, which was granted them under the title of the "Governor and Company of Adventurers Trading from England to Hudson's Bay."

In the following year, the company sent out Chas. Bayly to establish a post at Rupert River. He was accompanied by Chouart and Radisson, and remained in the country, thus inaugurating the first permanent English settlement on Hudson Bay. First settlement on Hudson Bay.

In 1674, Charles Albanel, a Jesuit missionary, arrived at the English settlement with letters from the Governor of Quebec, who had despatched him in 1672, overland from Quebec, to see what the English were doing on the bay. The route followed by Albanel was up the Saguenay River to Lake St. John, thence by the Chamouchouan River to the height-of-land and Lake Mistassini, and down the Rupert River to its mouth. An account of his trip is given in the Relations of the Jesuits, and is the first description of this portion of the country. Père Albanel.

In 1675, outposts were established at Moose and Albany, and a depot on Charleton Island, where the ship from England discharged her cargo and took on board the furs from the various posts, brought there in sloops. Establishment of Moose and Albany.

By 1685, the company had forts at Albany, Moose, Rupert, Nelson and Severn; also a small post on the East Main, or "Ison-glass River," where a mica mine was worked, but was soon abandoned as unprofitable.

In March, 1686, the directors of the French Company, on representation of the harm done to their trade by the English on the bay, obtained from M. de Denonville a body of Canadian and regular troops, under the command of M. de Troye. They were sent overland, reaching Hudson Bay in June, and captured Forts Rupert, Moose and Albany. This was the beginning of a desultory warfare, carried on with varying success, between the French and English for a number of years, until the Treaty of Ryswick in 1697. The seventh clause of the treaty restored to each belligerent the possessions held previous to this war. The eighth clause appointed commissioners to examine and determine the rights of either of the kings to places in Hudson Bay; "but the possession of those places which were taken by the French during the peace that preceded the present one, shall be left to the French by virtue of the foregoing article." In consequence, the only post left to the Hudson's Bay Company was the fort at Albany. Warfare between French and English at Hudson Bay.

In 1700, the Hudson's Bay Company addressed a communication to the Lords of Trade in reference to their boundaries. They proposed the Albany River, or the 53rd parallel of north latitude, as the boundary on the west coast of the bay, and the Rupert River as the boundary on the east coast. The French were ready to accept the Boundary claimed by Hudson's Bay Company.

55th parallel of north latitude, but this the company refused to agree to. In answer to the Lords of Trade, in 1701, the company made the further offer as to the limits between themselves and the French:—
 "2. That the French be limited not to trade by wood-runners or otherwise, nor build any house, factory or fort, to the northward of Hudson's River, on the east main or coast."

Treaty of
Utrecht.

Matters remained unsettled until the Treaty of Utrecht in 1713, when the French ceded all their rights to Hudson Bay to the English.

Boundary
claimed by
Hudson's Bay
Company.

In 1712, the company in a memorial to the Lords of Trade, and later in 1714, proposed for a settlement of the boundary between their territory and the French, "That the said limits begin from the island called Grimmington's Island or Cape Perdrix (Cape Mugford) in the latitude of $58\frac{1}{2}$ degrees north, which they desire may be the boundary between the English and the French on the coast of Labrador, towards Rupert's Land on the east main, and Nova Britannia on the French side."—"That a line supposed to pass to the south-westward of the said island of Grimmington or Cape Perdrix to the great Lake Miskosinke at Mistoveny, dividing the same into two parts as in the map now delivered"—"and from the said lake to run southward unto 49 degrees north latitude."

Delisle's map.

The map made by Delisle in 1703, shows the knowledge possessed by the French at the time of the Treaty of Utrecht of the interior of the Labrador Peninsula. On it is marked Lake Mistassini, discharging into James Bay, and also into Lake St. John. Pletipi, Manicuanan and Nichicun lakes are in their respective places, but the last is made to drain through Lake Pletipi into the Outardes River. At the head of the Peribonka River, there is a large lake named Outakouami, which discharges also into the East Main River, and a large stream flowing northward with the following note:—"R. que les sauvages disent tomber dans la mer du nord après 60 lieues de cours;" and the bay is shown in part near latitude 55° , with a break between it and "Bay du Sud" (Ungava), which extends southward between latitudes 61° and 57° . Hamilton Inlet is marked by a long narrow bay, without any large rivers at its head. The country northward of the East Main River and the eastern part of the southern watershed appear to have been unknown. Indefinite and rough as the topography of this map is, still it is greatly in advance of the English maps published about this time, which show only Lake Mistassini and the Rupert and East Main rivers in the interior of the Labrador Peninsula.

From the Treaty of Utrecht until after the cession of Canada, the Hudson's Bay Company appears to have confined its trade and investigations on the east side of the bay wholly to the coast. In 1732, a small post was re-established at the mouth of the East Main River, which was shortly afterwards made the headquarters of the east coast, and continued as such until after 1820, when two districts were established on this side of the bay, with headquarters at Rupert and Great Whale rivers. About the time of the re-establishment of East Main, a post was opened on Richmond Gulf for trade with the Eskimo, but was soon abandoned, after two massacres by the natives.

Hudson's Bay Company.

An ordinance respecting the limits of the King's Domain, issued at Quebec in 1733, makes mention of the posts of Tadoussac, Chekoutimy, Lac St. Jean, Nikaubau, Mistassinie, Papinachois, Naskapis, River Moisie and Seven Islands, showing that the lessees were well established throughout that territory. No records are obtainable of the other districts, seigniories, and fur leases granted at Quebec, but the above may be taken as an example of the manner in which the French traders had penetrated and established posts throughout the interior of the Indian country, many years previous to the English occupation of Canada. The traders and "coureurs des bois" must have travelled far into the interior of the Labrador Peninsula, where they lived the greater part of the time with and like the Indians, only returning to Quebec for a short time every two or three years. Much of the information obtained by these men was never recorded and is consequently lost, while the little that was written is very difficult of access.

Trading posts in the King's Domain.

In 1732, Joseph Normandin was sent by the governor to explore and survey the region about Lake St. John. He ascended the Chamouchouan River to Lake Nikaubau, and mentions Peltier post as well as one on Ashouapmouchouan Lake, which was first established in 1690.

Joseph Normandin.

Shortly after the conquest of Canada, the North-west Company was formed, and appears to have acquired, among others, the lease of the "King's Domain." Under its vigorous management, the fur trade in the North-west and Canada rapidly increased, and this company soon became antagonistic to the Hudson's Bay Company, which now began the establishment of inland posts. The first of these, inland on the east side of Hudson Bay, probably dates from this period; it was situated on the East Main River, about three hundred miles above its mouth, at Birch Point, where a portage-route leads southward to Lake

North-west Company.

Post inland on the East Main River.

Mistassini. Subsequently, and before the amalgamation of the Hudson's Bay and North-west companies, this post was removed to the outlet of Lake Mistassini, and again to its present position on the south-west bay, where the North-west Company also had a post on a long narrow point, a few miles to the southward. This appears to have been the only inland post of the Hudson's Bay Company established in Labrador prior to the amalgamation of the companies in 1821.

Labrador
Company.

Shortly after the conquest of Canada, the town of Brest, and one hundred and fifty miles of the north shore of the Gulf of St. Lawrence to the westward of that place, was granted to the Labrador Company of Quebec, with exclusive rights to the fisheries and fur trade. In this manner the entire north shore of the gulf was closed to private enterprise, and long remained so, as the coast to the westward of the Labrador Company's concessions was held by the seigniors of Mingan, whose grant extended to the eastern limit of the King's Domain.

Labrador
Coast under
jurisdiction of
Newfound-
land.

In 1763, the southern and eastern coasts of Labrador were placed under the jurisdiction of the Governor of Newfoundland; and the eastern and northern boundaries of the province of Canada were defined by the St. John River to its head, and from there by a line drawn through Lake St. John to Lake Nipissing.

Moravian
Missionaries.

In 1770, the Moravian missionaries first settled among the Eskimo on the Atlantic coast.

Major Cart-
wright.

About the same time Major Cartwright made settlements at Cape Charles and Sandwich Bay, bringing with him a number of people from Dartmouth, for the salmon fisheries and trade with the Eskimo and Indians.

Labrador
Coast.

In 1773, the coast of Labrador was restored to the jurisdiction of the Governor of Canada, on account of disputes between Newfoundland and the Labrador Company.

Hamilton
Inlet.

In 1777, the first English entered Hamilton Inlet for purposes of trade with the natives, and found there the remains of posts erected by the French prior to the secession. The first posts were established on the inlet, by a Quebec Company, in 1785.

André Mich-
aud.

André Michaud the celebrated French botanist, in 1782 passed through Lake St. John and reached Lake Mistassini. He had intended to descend the Rupert River to James Bay, but was obliged to return from Lake Mistassini, on account of the lateness of the season.

Labrador
again attached
to Newfound-
land.

In 1809, the eastern coast of Labrador was again attached to the Government of Newfoundland, but the area of coast was reduced, and extended only from Anse Sablon northward to Hudson Strait.

In 1811, the Moravian missionaries Kollmeister and Kmoch, explored the northern Atlantic Coast and Ungava Bay, and reported favourably on the climate and soil of the latter place. Kollmeister and Kmoch.

The Labrador Company was dissolved in 1820, and that part of the Gulf shore previously under its control was thrown open to settlement and private fisheries. Labrador Company.

After the amalgamation of the Hudson's Bay and North-west companies in 1821, the policy of the former appears to have changed; and the country to the east of Hudson Bay was shortly after explored, posts being established throughout the interior of the peninsula. Explorations East of Hudson Bay.

In 1814, the Rev. Mr. Steinhaur published in the Transactions of the Geological Society a short description of the Atlantic coast, together with notes on the various rocks found about the Moravian mission stations. Rev. Mr. Steinhaur.

Between 1821 and 1824, James Clouston was employed in exploring the country east of Hudson Bay. There are no available notes or records of his travels, and all that remains is a map on a small scale, showing the routes that he followed. These embrace the East Main River to the Tichagami Branch, a few miles beyond the old post of Birch Point, two portage-routes between the East Main and Rupert rivers, the Rupert River and Lake Mistassini, and the routes to Waswanipi on the Nottaway River. The original map is at Great Whale River post, where a tracing of it was made in 1888, which is now in the Geological Survey office. James Clouston's explorations.

In 1824, a party was fitted out at Moose Factory to proceed overland to Ungava Bay and there establish a post; but it was not until three years later that this was accomplished by Dr. Mendry, who coasted along the east shore to Richmond Gulf, and then passed inland to Clearwater and Seal lakes, thus reaching the head-waters of the Larch Branch of the Koksoak River, which was descended to near its mouth, and Fort Chimo there first established. This trip is the basis of Ballantyne's "Ungava" a popular story for boys. A map made of the route by Dr. Mendry, is at present at Moose Factory, and a tracing of it is in the Geological Survey office; the part between Clearwater Lake and the forks of the Larch River has been used, in the compilation of the map accompanying this report. Establishment of Fort Chimo.

In 1824, the Governor of Newfoundland was empowered to institute a court of civil jurisdiction along the coast of Labrador.

Between 1827 and 1829, Admiral Bayfield made charts of the Atlantic and St. Lawrence coasts for the British Admiralty. Admiral Bayfield.

In 1827, the first survey of Lake St. John was made for the Quebec Government by Larue.

John McLean. In January and February of 1838, John McLean, then in charge at Fort Chimo, crossed overland to Hamilton Inlet, where the Hudson's Bay Company had established posts in 1837, passing on the way through Lake Michikamau. He retraced the route and reached Fort Chimo again on the 20th April. The same year a post was established at Erlandson's Lake, which appears to have been situated on the headwaters of the Whale River. Another outpost was also established on the George River.

Discovery of
the Grand
Falls, Hamil-
ton River.

In 1839, McLean again started across to Hamilton Inlet with canoes, but reached only the Grand Falls of the Hamilton River, and thus had the honour of being the first white man to view this mighty cataract. Not having a knowledge of the portage-route past the falls, he was obliged to return without reaching his destination. In the following summer he was more successful, and reached Hamilton Inlet with canoes, as he also did in the two following years. An interesting account of McLean's trips and also much information concerning the country, is given by him in his book entitled "Twenty-five years in the Hudson's Bay Territory."

Fort Nas-
caupée.

In 1840, Fort Nascaupée was established on Lake Petitsikapau, drawing its supplies from Hamilton Inlet, and the post of Erlandson's Lake was then abandoned. This was followed in 1853 by the temporary withdrawal of the Hudson's Bay Company from Fort Chimo and other posts belonging to it.

Map of the
interior of
Labrador
Peninsula.

In 1842, John Beads and John Spenser, at Nichicun and Lake Kaniapiskau, compiled a map of the region surrounding these places giving the various branches and lakes of the rivers draining southward, westward and northward, from the central portion of the peninsula. This map was found at Nichicun in 1893, and is now in the Geological Survey office. It has been used largely in the compilation of the unsurveyed parts of the map accompanying this report.

List of trading
posts.

In his evidence before the select committee of the House of Commons on the Hudson Bay's Company, 1857, Sir George Simpson made a return of the various posts and number of Indians attached to each, throughout the territories of the company. The following list shows the posts then situated in the Labrador Peninsula:—Chicoutimi, Tadoussac, Isle Jeremie, Godbout, Seven Islands, Mingan, Musquarro, Natasquan, Northwest River, Rigolet, Kibokok, Great Whale River, Little Whale River, Fort George and Rupert House, all located on the coast, and Mistassini, Temiskami, Waswanipi, Mechiskan, Pike

Lake, Lake St. John, Nichicun, Kaniapiskau and Fort Nascaupée in the interior.

In 1860, A. F. Blaiklock surveyed the Mistassini and Chamouchouan rivers flowing into Lake St. John. Since that date, under the direction of the Quebec Department of Crown Lands, all the principal rivers of the southern watershed have been carefully surveyed to near their sources; and but little work remains to be done to complete the map of the rivers of this slope.

A. F. Blaiklock.
Surveys by
Quebec Crown
Lands Department.

The same year an expedition was sent by the United States Government, and a station was established on the Atlantic coast in latitude $59^{\circ} 54'$, to observe a solar eclipse. In the report of the United States Coast Survey, 1860, a short account of the voyage, with notes on the climate, together with a chart of Eclipse Harbour is given by Commander Alexander Murray; and notes on the geology of the northern coast of Labrador by Oscar M. Leiber.

United States
Coast Survey
Eclipse Station.

In 1862, Henry Yule Hind ascended the Moisie River about 150 miles; and wrote two volumes on his experiences and information gathered from Indians and other sources relating to the interior of Labrador. This book is still quoted as the standard authority on the Labrador Peninsula.

Henry Yule
Hind.

In 1860 and 1864, Dr. A. S. Packard visited the Atlantic coast, and besides various earlier papers on the fauna and flora, published in 1891, a work entitled "On the Labrador Coast," which deals very fully with the history and natural resources of the Atlantic coast, and is a valuable addition to the bibliography of Labrador.

A. S. Packard.

In 1866, the Hudson's Bay Company again established Fort Chimo, and shortly afterwards opened posts at George and Whale rivers, where extensive salmon and porpoise fisheries are still carried on, besides trade with the natives.

Fort Chimo
re-established.

Between 1866 and 1870, Père Babel, O.M.I., travelled inland from Mingan, and lived with the Indians, exploring with them both branches of the Hamilton River, and the headwaters of many of the streams of the southern slope. A map made during his wanderings, is kept at the mission station of Betsiamites, and when consideration is taken of his imperfect instruments and other disadvantages, his accuracy is wonderful.

Père Babel.

About 1875, the Roman Catholic missionaries visited and established a mission for the Indians at Northwest River; and during the two following summers, Père Lacasse crossed overland from that place to Fort Chimo, returning in the Hudson's Bay Company's vessel.

Roman
Catholic
missionaries.

Moravian missionaries.

In 1873, the Moravian missionaries published two maps of the Atlantic coast; the northern sheet extending northward from latitude 57°, the southern sheet embracing the coast from Hopedale to Sandwich Bay.

Abandonment of interior trading posts.

With the establishment of posts on Ungava Bay, the Hudson's Bay Company abandoned their interior posts on the Hamilton River, and at Lake Michikamau. Fort Nascaupée and Michikamau were closed in 1873, and the post at the head of Lake Winokapau in 1874. The closing of these posts now leaves only Nicheun, Mistassini and Waswanipi in the interior of the peninsula.

Jurisdiction of Newfoundland.

In 1876, the extent of the jurisdiction of the Government of Newfoundland in Labrador, was defined in Letters Patent constituting the office of Governor and Commander-in-Chief of the Island of Newfoundland. "All the coast of Labrador, from the entrance of Hudson Straits to a line to be drawn due north and south from Anse Sablon on the said coast to the fifty-second degree of north latitude, and all the islands adjacent to that part of the said coast of Labrador."

Hudson Strait exploration.

In 1884 and 1885, the Dominion Government sent a vessel to Hudson Strait, to establish observation stations on both sides, in order to obtain reliable information concerning the amount and movements of the ice.

Rev. Mr. Peck.

In 1885, the Rev. Mr. Peck, of the Church Mission Society, crossed from Richmond Gulf to Ungava Bay, following the route previously taken by Dr. Mendry.

Lucien M. Turner.

During 1885 and 1886 Mr. L. M. Turner was engaged collecting birds and mammals, and doing other scientific work in the vicinity of Fort Chimo for the Smithsonian Institution at Washington.

R. F. Holmes.

In 1887, Mr. R. F. Holmes attempted to reach the Grand Falls of the Hamilton River from its mouth, but, being handicapped with a heavy boat and a poor crew, reached only Lake Winokapau. He made an excellent map of the river to that point, and wrote an account of his trip, which appeared in the Transactions of the Royal Geographical Society.

Expeditions up Hamilton River.

In 1891, two separate expeditions from the United States ascended the Hamilton River, and visited the Grand Falls within a few days of each other. Messrs. Austin Cary and D. M. Cole * who were the first to reach the falls, had the misfortune to burn their boat and outfit, and were obliged to tramp to the mouth of the river, two hundred and

* Bulletin American Geog. Soc., vol. xxiv., p. 1.

fifty miles distant from where the mishap took place. This they very pluckily accomplished, passing unseen Messrs. Henry G. Bryant * and C. A. Kenaston, who were on their way up the river at the time.

The following is a list of the reports relating to the Labrador Peninsula published by the Geological Survey of Canada, from explorations made by members of the staff :—

Explorations
by the staff of
the Geological
Survey.

Report, 1853-56.—On the Island of Anticosti, and the Mingan Islands.—J. Richardson.

Report, 1857.—On part of the Gaspé Peninsula from Magdalen River to Gaspé Bay, and on Lake St. John.—J. Richardson.

—On the Fauna of portions of the Lower St. Lawrence, the Saguenay, Lake St. John, etc.—R. Bell.

Report, 1866-69.—On the north shore of the Lower St. Lawrence.—J. Richardson.

Report, 1870-71.—On the geology of the country north of Lake St. John.—J. Richardson.

Report, 1871-72.—On exploration of Country between Lake St. John and Lake Mistassini.—W. McQuatt.

Report, 1877-78.—Report on an Exploration of the East Coast of Hudson Bay.—R. Bell.

Report, 1879-80.—Report on Hudson Bay and some of the Lakes and Rivers lying to the west of it.—R. Bell.

Report, 1882-83-84.—Observations on the Coast of Labrador and on Hudson Strait and Bay.—R. Bell.

Report, 1885.—Report of the Mistassini Expedition.—A. P. Low.

—Observations on the Geology, Zoology and Botany of Hudson Strait and Bay.—R. Bell.

Report, 1887-88.—Report on Explorations in James Bay and the Country east of Hudson Bay, drained by the Big, Great Whale and Clearwater Rivers.—A. P. Low.

PHYSICAL GEOGRAPHY.

The eastern coast of the Labrador Peninsula extends north-north-west, from the Strait of Belle Isle to Cape Chidley, a distance of about seven hundred miles, or from latitude 52° to latitude 60° 30', fronting the North Atlantic. The northern boundary from Cape Chidley to Cape Wolstenholme, at the entrance of Hudson Bay, in a straight line, is nearly five hundred miles long, and runs about west-north-west in direction, forming the southern shore of Hudson Strait including Ungava Bay. A line drawn from Cape Wolstenholme to the bottom of James Bay, runs nearly north-and-south for eight hundred miles, and corresponds closely to the eastern shore-line of the peninsula. The southern boundary is arbitrary but has been taken as a straight line extending in a direction nearly east from the south end of James Bay near latitude 51°, to the Gulf of St. Lawrence near Seven Islands in latitude 50°. This line is nearly six hundred miles long, and passes close to the south end of Lake Mistassini. From where the line reaches the Gulf coast, in the neighbourhood of Seven Islands, the shore-line forms the southern boundary to the Strait of Belle Isle, with a length of somewhat over five hundred miles.

Boundaries of
the Labrador
Peninsula.

* A Journey to the Grand Falls of Labrador, Geog. Club, Philadelphia.

Extent.

The total area embraced within these boundaries is approximately 511,000 square miles, of which, previous to the present explorations, 289,000 square miles were practically unknown. There still remains about 120,000 square miles of the northern portion of the peninsula, between Hudson and Ungava bays, totally unknown to anyone except the wandering bands of Eskimo who occasionally penetrate inland from the coast.

Atlantic Coast.

The Atlantic coast is exceedingly irregular, being deeply cut by many long narrow bays, or fiords, so that the coast-line exceeds many times the direct distance from Belle Isle to Cape Chidley. Hamilton Inlet is the largest and longest of these inlets, extending inland over one hundred and fifty miles from its mouth. Among others, Sandwich, Kaipokok, Saglek and Nachvak bays are from thirty to fifty miles deep. These narrow fiords are surrounded by rocky hills that rise abruptly from the water to heights ranging from 1000 feet to 4000 feet. The water of the inlets is generally deep and varies from ten to one hundred fathoms. A fringe of small rocky islands extends almost continuously along the coast, with a breadth of from five to twenty-five miles. Outside the islands, the inner banks extend seaward for an average distance of about fifteen miles, and on them the water is rarely over forty fathoms deep. From this it will be seen that the fiords, as a rule, have greater depths than the banks outside the island fringe.

Formation of fiords.

To account for such an apparent anomaly, it is necessary to consider the formation of both the fiords and banks. The fiords appear to be valleys of denudation of very ancient origin, eroded, at least in part, when the elevation of the peninsula was considerably greater (at least 600 feet) than at present. Their remote antiquity is established by the deposition in their lower levels of undisturbed sandstones of Cambrian age. The banks are likely of comparatively recent formation, and appear to be made from material carried off the higher lands by glaciers and deposited by them as a terminal moraine among and outside the fringe of islands, to be subsequently flattened out by floating ice and currents, thus filling up the deep channels at the mouths of the fiords.

Northern coasts.

The coast adjacent to Hudson Strait and Ungava Bay has not been examined closely, but enough is known for us to state that it is generally bold, with highlands rising immediately from it. Small rocky islands form a narrow fringe in many places, especially about Ungava Bay, and the coast is indented with small bays, but not to such an extent as the Atlantic coast.

Hope's Advance is a western extension of Ungava Bay, as yet unexplored. The navigation of Ungava Bay and Hudson Strait is rendered dangerous to sailing craft by the strong currents and exceedingly high tides, the latter having a mean rise in Ungava Bay of nearly forty feet, and at exceptional spring-tides they have been known to rise sixty feet. Dangerous currents.

From Cape Wolstenholme to near Cape Jones, at the entrance to James Bay, the eastern coast-line of Hudson Bay is high and rocky. Coast of Hudson Bay. The coast between the entrance to Hudson Strait and Cape Dufferin, a distance of nearly three hundred miles, has not yet been continuously explored. Mosquito Bay is situated along this part of the coast, and was formerly supposed to connect with Hope's Advance. Such has since proved not to be the case, and Mosquito Bay has been found to extend inland not more than seventy-five miles. Between this bay and Cape Dufferin, there is a fringe of islands stretching out from ten to twenty miles from the mainland. To the southward of Cape Dufferin, the coast-line remains high, and an almost continuous line of high islands of Cambrian rocks forms a safe channel for small boats, as far south as Great Whale River. This channel varies from two to eight miles in width. South of Great Whale River, to within a short distance of Cape Jones, the coast is unprotected and bold.

The eastern shore-line of James Bay is generally low, and the waters of the bay are very shallow and dotted far out with rocky islands and bouldery reefs, between which there is a perfect labyrinth of channels, navigable with smallcraft, but dangerous to approach with large vessels.

The north shore of the Gulf of St. Lawrence, in many places, has a more or less wide interval of low land, between the shore and the rocky plateau behind. Gulf of St. Lawrence coast. From Seven Islands to Natashquan Point, the shore is comparatively regular and the islands few in number. To the eastward of Natashquan, as far as the Strait of Belle Isle, the coast is greatly indented by small bays and coves, and islands are numerous, especially between Cape Whittle and Blanc Sablon.

The peninsula of Labrador is a high, rolling plateau, which rises somewhat abruptly, within a few miles of the coast-line, to heights between 1500 and 2500 feet, the latter elevation being somewhat greater than the watershed of the interior. The interior country is undulating, and is traversed by ridges of low rounded hills, that seldom rise more than 500 feet above the general surrounding level. From the barometer readings, taken during the season of 1894, in conjunction with stationary barometers at Hamilton Inlet and Anticosti, the general level of the interior plateau, about the Upper Hamilton General elevation and contour.

River and Lake Michikamau, near the central watershed, varies from 1600 feet to 1800 feet, and this may be taken as the general height of much of the interior of the peninsula. The highest part of the main interior mass is near the high granite area between the head-waters of the Peribonka, Manicouagan and Outardes rivers, flowing into the St. Lawrence, the East Main and Big rivers, flowing into Hudson Bay, and the Koksoak River flowing into Ungava Bay. The general elevation of this area exceeds 2000 feet.

Gradual slope
towards
James Bay.

The only portion in which the general level is attained by a gradual slope, is the part facing James Bay, where the land along the coast is low, and the rise eastward towards the interior is so light that one hundred miles inland it is only about 700 feet above sea-level.

Highlands
of the St.
Lawrence.

Beyond this the land continues to rise gradually, so that Lake Mistassini is only 1300 feet above sea-level. As before stated, the rise from the coast in other places is quite rapid; and along the St. Lawrence coast there is a range of high ground extending from the neighbourhood of Quebec to below the St. John River. The larger streams have cut deep valleys through this range. Along the Saguenay, at Cape Eternity, the hills rise almost sheer 1500 feet above the river; while behind, in the Lake St. John region, few elevations exceed 1000 feet. On the Bersimis River, the high range begins about forty-five miles inland and continues to about the one hundredth mile, beyond which the country is comparatively level, and somewhat lower. On the Romaine and St. John rivers, the high lands formed from a great mass of irruptive rocks, begin about twenty-five miles from the coast, and are about fifty miles broad. The general level of this belt is nearly 2000 feet and many of the summits are more than 2500 feet above sea-level, while the general level of the country immediately behind them is not much over 1600 feet. H. Y. Hind* mentions similar high lands on the Moisie River, where the general level is above 1500 feet, and some of the mountain ranges are 3000 feet above sea-level.

Atlantic high-
lands.

Along the Atlantic coast, the land rises abruptly inland, almost everywhere, to altitudes varying from 1000 feet to 1500 feet, from the Strait of Belle Isle to the vicinity of Nain. To the northward of Nain the coast range is much higher, and, in the neighbourhood of Nachvak Bay, ranges of sharp, unglaciated mountains rise abruptly from the sea to heights varying from 2500 feet to 4000 feet; while farther north they are reported to culminate in peaks of 6000 feet, a few miles inland. With a slight decrease in height, this range con-

*Explorations in Labrador, vol. 1, chap. ix.

tinues northward to the barren islands at Cape Chidley. This mountain range appears to be confined to the coast region and probably is under fifty miles in width, the country on the western side sloping rapidly down to the level of the interior plateau. About Ungava Bay, the general level of the plateau is probably somewhat under 1000 feet, and the land rises gradually towards the interior. Little or nothing is known definitely of the great northern area between Ungava and Hudson bays, but, from observations by Dr. R. Bell, made along the coasts, the land appears to rise rapidly for 1000 feet, and then more gradually to elevations between 1500 and 2000 feet. From information obtained from the Eskimo at Ungava, there would seem to be a low tract of country extending westward from Hope's Advance towards Mosquito Bay on the Hudson Bay coast, and also another area of comparatively low country westward of the Leaf Lakes and of the Koksoak River valley.

The land fronting the Hudson Bay coast, as far south as Cape Jones, reaches the 1000 feet level within a short distance from the sea, and then rises quickly to a general level between 1500 and 2000 feet, the latter being the maximum of elevation in this region, as determined by the few explorations in this portion of the peninsula. The gradual rise from the seaboard of the country to the east and south-east of James Bay, has already been mentioned.

Elevation of
land fronting
Hudson Bay.

To sum up the foregoing statements of levels,—the interior of the peninsula is almost flat, so that in an area of 200,000 square miles, there is not a difference of general level of more than 300 or 400 feet, and the highest general level of the interior is under 2500 feet. A belt of land somewhat higher than the general interior follows the St. Lawrence coast, a short distance inland. The northern half of the Atlantic coast rises in a chain of mountains, considerably higher than any other portion of the peninsula. Along the northern and western coasts there is no evidence yet obtained to show the existence of a coastal ridge, but rather a probability that the general elevation increases towards the interior.

Summary of
elevation.

Like the other portions of northern Canada underlain by glaci-
Archæan rocks, the interior of the Labrador Peninsula is covered with myriads of lakes, that occupy, at a moderate estimate, at least one-fourth of the total area. In size, these vary from small narrow ponds, to lakes with surfaces hundreds of square miles in extent. Great Mistassini and Michikamau lakes have areas considerably exceeding 500 square miles. Among those of which the area is between 200 and 500 square miles, may be mentioned Mancuan Lake, on a tribu-

Lakes.

tary of the Peribonka River, Pletipi Lake, at the head of the Outardes River, the Manicouagan lakes, on the headwaters of the river of the same name; all sending their waters into the St. Lawrence. Discharging into the Atlantic are Winokapau, Petitsikapau, Ashuanipi and Attikonak lakes on the Hamilton River, and Grand Lake on the Northwest River, which also drains Lake Michikamau. On the rivers discharging northward, Lake Kaniapiskau is the only one yet partly explored, but reference to the map will show a number of large lakes on the various tributaries of the Koksoak and George rivers, which have been located from information derived from Hudson's Bay Company employees and Indians.

Western watershed

On the western watershed, Clearwater Lake is one of several large lakes lying in an area between the sources of the Stillwater branch of the Koksoak River, and the Nastapoka, Clearwater, Little and Great Whale rivers flowing into Hudson Bay; all of which rise and flow through a number of large unexplored lakes.

Lake Nichicun is near the headwaters of the Big River and is drained by that stream. The Mistassini lakes discharge into the Rupert River, while the Nottoway River, which discharges into the southern part of James Bay, drains, among others, lakes Waswanipi and Chibougamoo.

Lakeless area.

Besides the lakes mentioned, there are hundreds having a surface area between 20 square miles and 100 square miles, while smaller lakes are numberless. The only portion of Labrador not thickly covered with lakes, is the low country extending inland for about 100 miles from the east coast of James Bay. This area has been covered with a deep mantle of marine sands and clays, which has filled up the inequalities of the surface, and prevented the formation of lakes; it is covered instead by a net-work of small streams, with deep channels cut out of the stratified drift.

Formation of lakes.

The lakes, except the largest, are usually confined in the shallow valleys between low rocky ridges, by barriers of drift, and in consequence their depth is not great, seldom exceeding fifty feet, while many of them are under twenty feet deep. Mistassini and Michikamau lakes, occupying ancient basins, in which Cambrian rocks were deposited, are among the exceptions, the former having a depth of over 400 feet, while that of the latter is said, by the Indians to exceed 250 feet. Lake Winokapau, in the valley of the Hamilton River, and Lake Mouchalagan on the Manicouagan River, are other exceptions, the former being over 400 feet deep, and the latter 650 feet deep, but, as will be explained further on, these and Grand Lake, on the Northwest River, differ from the ordinary lakes in their manner of formation.

It follows, from the great number of lakes, that the country must be covered with a perfect network of streams discharging them. The discharges and lakes interlock so closely that, with a knowledge of the country, it is possible to travel with canoes in any direction, the longest portages never exceeding two or three miles. Great depths
in lakes.

There are four principal watersheds to the peninsula : of these the southern is the smallest, its rivers rarely exceeding 300 miles in length ; the most important are the Saguenay and its branches, Bersimis, Outardes, Manicouagan, Moisie, Romaine, Natashquan and St. Augustine. The eastern watershed drains chiefly into Hamilton Inlet, three large rivers flowing into its head. Of these the Hamilton River is much the largest, taking its rise near the middle of the peninsula and draining an area extending from latitude 52° to latitude 54° covering seven degrees of longitude. Its longest branch rises nearly 600 miles from its mouth. The other rivers of Hamilton Inlet are the Northwest and Kenamou, the former draining a large area to the north of the Hamilton River, the latter flowing in from the south-west. Apart from these three large streams, no other rivers of importance are found along the Atlantic coast, on account of the high lands of the coast cutting off the drainage of the interior and forcing it to flow northward into Ungava Bay.

The Koksoak River is the largest stream flowing northward, and is probably the largest river of Labrador. Besides the main stream, there are a half dozen tributaries, each of which drains an important basin. The longest branch flows out of the northern end of Summit Lake, on the 53rd parallel of latitude, while a branch of the Manicouagan River flows out of the southern end of the same lake, thus connecting by water the Gulf of St. Lawrence with Ungava Bay. The total area drained by this river and its tributaries is about 60,000 square miles. The George River, is another great stream which rises in large lakes close to Lake Petitsikapau on the Hamilton River, and drains a wide area westward of the Atlantic coast range. The Whale River is a smaller stream lying between the George and Koksoak rivers. Koksoak
River.

The western drainage basin is the greatest in Labrador and is emptied by large rivers, that rise far inland, close to the head-waters of the Koksoak and Saguenay rivers. Proceeding from the northward, the larger rivers flowing into Hudson Bay are :—The Nastapoka which flows out of several large lakes to the eastward of Clearwater Lake and near the head of the Stillwater branch of the Koksoak River ; the Little and Great Whale rivers, that rise close to the western branches of the Koksoak ; the Big River which rises in the mountainous area south Western
rivers.

and east of the head of the East Main River, in about latitude 52°, and close to the sources of the Peribonka, Manicouagan and Outardes rivers tributaries of the St. Lawrence. From its source the Big River flows northward nearly one hundred and fifty miles, passing through Lake Nichicun, and then turns westward four hundred miles, emptying into James Bay, near latitude 54°

The East Main River takes its rise in a number of lakes close to Lake Nichicun and flows nearly west, discharging into James Bay a short distance north of latitude 52°. The Rupert River forms the discharge of the Mistassini lakes, and, having such large reservoirs at its head, is not subject to the same fluctuations of volume, as the other rivers. It empties into Rupert Bay close to the mouth of the Nottoway River, which drains a wide area to the south-east of Hudson Bay, and rises in a number of large lakes close to the height-of-land dividing it from the St. Maurice River, which joins the St. Lawrence at Three Rivers.

Ancient river
channels.

The channels of most of the rivers of Labrador are of very ancient origin, apparently dating back to a period before the deposition of the Cambrian rocks. These valleys are cut deep into the general level of the plateau, their depth and length apparently depending on the volume of water carried, and thus showing that they have been mainly formed by normal denudation.

The larger rivers flowing southward, have deep valleys cut through the highlands of the coast region, and the streams are often from 500 feet to 1000 feet below the general level of the surrounding country. The heads of these valleys are from one hundred to three hundred miles from their mouths; and at their upper ends the rivers descend from the level of the interior in a succession of heavy falls, through narrow gorges where processes of erosion are at present extending and deepening the valleys. This erosion is, however, so exceedingly slow, that the change in the heads of the valleys, since glacial times, has been practically nothing, owing no doubt to the hardness and resistance to weathering of the Archaean rocks in which they are cut. The gorge of the Saguenay, with its almost vertical walls rising 1500 feet above the surface of the water, and its great depth of more than 800 feet in places, is an excellent example of one of these ancient river-valleys. That of the Hamilton River, which is cut back from the head of Hamilton Inlet for nearly three hundred miles, and of which the depth is from 700 feet to 1200 feet below the general level of the surrounding country, is another fine example of river erosion. The rivers occupying smaller valleys, are all of the same type. The East Main and Rupert rivers, flowing as they do on the gradual slope towards James

Bay, where the marine deposits of sand and clay are found inland about one hundred miles, have not the marked valleys found elsewhere, but descend in a number of steps, where they have either cut narrow gorges out of soft Huronian schists, or fall directly over granitic ledges. The ancient valleys of these streams appear to have been filled up during the deposition of these marine beds, and the present river-courses are of post-glacial origin.

Before entering the ancient valleys above described, all the rivers in central Labrador flow almost on the surface of the country, and are broken into chains of lakes often formed by dams of glacial drift, which in other places form low ridges that divide the streams into different channels. These channels wander about on the lower levels of the interior country in a most bewildering manner, and render travel without a guide excessively difficult.

Newchannels.

Climate.

The climate of Labrador ranges from cold temperate, on the southern coasts, to arctic on Hudson Strait and the high lands of the northern interior, and is generally so rigorous that it is very doubtful if the country will ever be fit for agriculture north of latitude 51° , except on the low grounds near the coast. Along the east coast of James Bay, good crops of potatoes and other roots are grown as far north as Fort George—about latitude 54° —while on the Atlantic coast of the peninsula, about the head of Hamilton Inlet, similar crops are easily cultivated. On the outer coast the climate is more rigorous, and appears to be much affected by the northern current, with its numerous floating icebergs, which lowers the mean temperature and renders the growth of root crops slow and uncertain at Rigolet in latitude 54° . Garden vegetables are, however, grown at Nain in latitude $56^{\circ} 30'$; but extra precautions are taken with them, such as the building of walls to protect them from the east wind, and covers put over them when in danger from summer frost. At Fort Chimo, near the mouth of the Koksoak River in latitude 58° , with care small patches of turnips, lettuce and radishes are grown.

Climate along the coasts.

In the interior, at the Hudson Bay's post of Mistassini, in latitude $50^{\circ} 30'$, a crop of potatoes is raised annually, but, owing to the shortness of the season and the prevalence of summer frosts, they rarely mature without the tops being frozen. No other vegetables are cultivated here at present. At Nichicun attempts are made to grow potatoes, but they have always proved more or less failures, owing to frosts in July and August. It will thus be seen that the prospects of the

Climate of the interior.

Absence of
grass.

Summer
season.

Winter
season.

settlement of the central portion of Labrador, for purposes of agriculture, are by no means bright; and, if settlements are made for other purposes, the inhabitants will have to depend largely on more southern localities for their vegetable food. Owing to the absence of grass plains, and to the mantle of moss and lichens that covers the surface of the ground almost everywhere, there is little likelihood that it will ever be a grazing district. The high lands of the interior have only two seasons, winter and summer. The summer season begins almost simultaneously throughout the interior, and the jump from winter into summer occurs as a rule during the first two weeks of June, when the snow disappears, and the ice leaves the rivers and lakes, except the largest, where it often remains until July. With the disappearance of the snow and ice, the temperature during the day rapidly increases, and the leaves are almost immediately put forth by trees and bushes. During 1894, frosts were of almost nightly occurrence until June 28th, when a thin sheet of ice was formed in the vessels about camp, and slight flurries of snow fell in the morning. After this date no frost was noted, but, thermometers having unfortunately been broken, the exact temperature could not be taken. To the north of latitude 52°, snow falls and ice begins to form in the small lakes about the middle of September. From early in October the snow remains permanently, and all the smaller lakes are solidly frozen, so that, for the greater part of the interior plateau, there is at most only three months of summer. The temperature during the winter season is often very low on the interior high lands, away from the influence of the sea. The coldest months are December, January and February, and the following readings of thermometers taken at Mistassini* in 1885, will give an idea of the temperature of that region, which appears to be somewhat higher than about Nichicun and the upper Hamilton River.

Temperatures
at Lake Mis-
tassini.

—	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
Mean temperature	-18.5	-00.1	01.9	25.3	42.3	53.1	59.9	56.7
Highest temperature	16	30	35	54	85	79	76	81
Lowest temperature	-56	-46	-47	-19	08	30	39	31

Great thick-
ness of ice.

According to reports of the Indians, the ice in Lake Michikamau is 7 feet 6 inches thick on an average, and the amount of continuous frost to form such a thickness must be very great. The ice in Lake Winokapau, in the deep valley of the Hamilton River, was from actual

*Annual Report, Geological Survey of Canada, vol. I. (N.S.), 1885, p. 16 D.

measurement found to be 4 feet 9 inches. From the journal kept at the Lake Winokapau post on this lake, between 1866 and 1874, the first snow generally fell about September 20th and continued until June, the latest record being June 10th. The lowest temperature recorded was 55° below zero. Geese and summer birds arrived on or about May 10th. From the journals at Northwest River post, the lowest temperature recorded from 1867 to 1893, was 53° below zero. There are several observations of 45° below zero, which appears to be the minimum winter temperature of most years. At Rigolet, where the temperature is moderated by the open sea, the thermometer rarely registers 40° below zero. At Fort Chimo, where the open sea is not far distant, 45° below zero is said to be the lowest temperature registered. The summer temperature of the Atlantic coast region is considerably lower than inland or along the western coast. As a rule the thermometer in the interior—north of Mistassini—rarely rises above 80° during the middle of the day on more than a few days during the summer season.

The temperature depends greatly on the direction of the winds. During the summer, south and south-west winds prevail in the interior, and are accompanied by higher temperature and often overcast sky, with drizzling rain. The west and north-west winds bring clear weather with lowering temperature, especially during the winter season. North and north-east winds are usually accompanied by heavy storms of rain and snow, with cold moist atmosphere. East and south-east winds, as a rule, blow with clear pleasant weather.

The precipitation of moisture over the interior area is not great. During the winter the snowfall varies from three to six feet, and the greater part of it descends during the periods of north or north-east wind, which are not common; the north-west wind, blowing at least three-quarters of the time during the winter season, is accompanied by a bright clear atmosphere. During the summer season the precipitation, if not great, is constant, as a day rarely passes without drizzle, or thunder showers, which lower the temperature.

At Northwest River, the head of Hamilton Inlet freezes completely over between the 1st and 15th of December, and opens again between May 15th and June 15th. Snow falls early in October, and from that date to about the first week in May, the latest record being July 2nd. At Rigolet, the outer part of Hamilton Inlet rarely or never freezes solid before the middle of January, and in some winters does not close at all. This is due to the strong currents in this part of the inlet. Sandwich Bay, nearly one hundred miles farther south, generally freezes over in the end of December, and the same time may be taken as that of the closing of most of the larger fiords of the

Snow.

Atlantic coast. About Fort Chimo, the lower grounds are permanently covered with snow by the 1st of December, this covering remaining until the 10th of June. The higher hills retain snow until the last of August, and by the middle of September snow again covers the tops of the distant high hills.*

Soil.

Character of
soil on the
Archæan area.

The soil of the greater part of the peninsula is derived from the underlying Archæan rocks, and is mostly in the form of glacial till, mixed with boulders of various sizes. The till is a mixture of sand and clay in which the former greatly predominates. In many large areas which have been traversed by fire, much of the vegetable matter of the surface has been destroyed, and the remaining soil supports only a scant growth of small trees. Along the sides of the river-valleys the drift has been re-arranged and mixed with sediments. Here the soil, though generally light and sandy, is richer than the unmodified till; and the size and variety of trees growing on it are consequently greater. Within the limits of the marine deposits, about the margins of the peninsula, the stratified sands are underlain by bedded clays, and as the coast is approached, the overlying sands thin out, leaving the clays near the surface, thus producing a light soil with a heavy subsoil, on which the vegetation is much better than anywhere else, except on the lower banks and islands in the rivers near the coast, where the sands and clays are topped with deposits of alluvium. The soil covering the areas of Cambrian rocks, being made up of the débris of limestone, shale, and other rocks of this formation, is of a heavier nature than that formed from the Archæan rocks; and the change from one to the other is marked by the better growth of trees on the former.

Marine
deposits.Cambrian
débris.

TREES AND OTHER PLANTS.

Various trees.

The southern half of the Labrador Peninsula is included in the sub-arctic forest belt, as described by Prof. Macoun.† Nine species of trees may be said to constitute the whole arborescent flora of this region. These species are :—*Betula papyrifera*, Michx., *Populus tremuloides*, Michx., *Populus balsamifera*, Linn., *Thuja occidentalis*,

* Annual Report U. S. Bureau of Ethnology, 1889 90.—Ethnology of the Ungava District. L. M. Turner, p. 172.

† The Forest Trees of Canada. John Macoun.—Trans. Royal Soc. Canada, Sec. iv., 1894, pp. 5-7.

Linn., *Pinus Banksiana*, Lam., *Picea alba*, Link., *Picea nigra*, Link.,
Abies balsamea, Marsh, and *Larix Americana*, Michx.

The distribution of the forest areas and the range of the various Distribution.
trees depend on several factors, among which may be mentioned, position
as regards latitude, height above sea-level, distance from sea-coast,
and character of the soil, all of which are important.

The forest is continuous over the southern part of the peninsula to Forest areas.
between latitudes 52° and 54°, the only exceptions being the summits
of rocky hills and the outer islands of the Atlantic coast. To the
northward of latitude 53°, the higher hills are treeless and the size and
number of the barren areas rapidly increase. In latitude 55°, more Barren
than half the surface of the country is treeless, woods being only found grounds.
about the margins of small lakes and in the valleys of the rivers. Trees
also decrease in size until, on the southern shores of Ungava Bay,
they disappear altogether. The Leaf River, which empties into the
bay a few miles north of the mouth of the Koksoak River, is the
northern limit of forest trees on the west side of Ungava Bay.

Along the east coast of Hudson Bay, Dr. Bell found trees growing a
few miles beyond the north end of Richmond Gulf.*

In the neighbourhood of Clearwater Lake, the writer found many
clumps of black spruce and larch, and, according to Indian reports,
small patches extend to the Nastapoka River in latitude 57°. So that
a line drawn a little south of west, from the mouth of the Leaf River Northern tree
to the mouth of the Nastapoka River on Hudson Bay, would give a limit.
close approximation to the northern tree limit of western Labrador.

The tree-line skirts the southern shore of Ungava Bay and comes Atlantic
close to the mouth of the George River, from which it turns south-south-
east, skirting the western foot-hills of the Atlantic coast range, which
is quite treeless, southward to the neighbourhood of Hebron, in lati-
tude 58°, where trees are again found in protected valleys at the heads
of the inner bays of the coast. At Davis Inlet, in latitude 56°, trees
grow on the coast and high up on the hills, the barren grounds being
confined to the islands and headlands, which remain treeless to the
southward of the mouth of Hamilton Inlet. These barren islands and
bare headlands of the outer coast, along with the small size of the
trees on the lowlands, have caused a false impression to be held
regarding much of the Atlantic coast, which from Hamilton Inlet
southward is well timbered about the heads of the larger bays and on
the lowlands of the small river-valleys.

*Report of Progress, Geol. Surv. Can., 1877-78, p. 256.

The distribution of each of the several species of trees depends on conditions similar to those affecting the forest areas in general.

Distribution
of white
birch.

Betula papyrifera, Michx. (White, Paper, or Canoe Birch) is found everywhere throughout the southern portion of the peninsula. Except in the district to the south-west of Lake Mistassini, drained by the Nottoway River, and on the southern watershed, the trees do not grow sufficiently large or straight to afford bark for canoe building, and the Indians of the more northern portions have to depend upon bark imported by the Hudson's Bay Company for their canoes. About Lake Nichicun and on the upper waters of the Hamilton River, the largest trees rarely exceed eight inches in diameter. The trees are found in thickets of second-growth, on the hillsides which have been traversed by fire; they also grow sparingly in unburnt portions. Northward of Nichicun, the white birch becomes rapidly smaller and along the upper Koksoak River does not average three inches in diameter. At Cambrian Lake, where the limestones are encountered and the river-valley is deep and protracted, the size of the trees improves, and birches six inches in diameter are not uncommon. Below the junction of the Swampy-bay River, the trees again become small, and finally die out on the Koksoak River a few miles above Fort Chimo. On the Hudson Bay side, the northern limit of white birch is near the mouth of the Great Whale River, while inland it is found, in small straggling clumps, at the head-waters of the south branch of that river. About Hamilton Inlet, birch is common, and, at the head of the inlet, trees up to ten inches in diameter are not uncommon.

Northern
limits.

Distribution
of aspen.

Populus tremuloides, Mich. (Aspen). The range of this tree depends, to a great extent, on the nature of the soil. In the southern portion of the peninsula, it is found as a second growth along with the white birch, and also in clumps in the original forest. It appears to be most plentiful on the western half of the peninsula, where it grows most abundantly on the unmodified glacial till of the drift ridges. At Lake Mistassini, this tree is abundant and is often ten or twelve inches in diameter about the southern portion of the lake. Along the upper East Main River, only small clumps of bent and twisted trees are seen, while about Nichicun it is exceedingly rare. To the northward of Nichicun, this tree was not seen along the route followed to Ungava Bay. On the Hudson Bay coast, the neighbourhood of Cape Jones is the northern limit of the aspen; while inland it is found on the portage-route, between the lower and upper parts of the Big River, in latitude 54°. About the head of Hamilton Inlet, and along the river below the Grand Falls, clumps of aspen are frequently

met with. But above the Grand Falls this tree was not seen anywhere on the waters of the Hamilton River, its first occurrence on the route southward being near the portage-route leading to the Romaine River from Lake Attikonak. Along the Romaine River, it soon becomes common as the stream is descended. On the Manicouagan River aspen is found in the deep river-valley to beyond latitude 52°, but does not grow on the surrounding table-land.

Populus balsamifera, Linn. (Balsam Poplar) is met with farther north than the aspen; but it appears to confine itself to the heavy clay soil of the river-valleys, or to the modified drift of the Cambrian areas. It is met with along the Big and East Main rivers, flowing into Hudson Bay, and its northern limit on this side of the peninsula is the Bishop Roggan River, the next stream north of the Big River. Along the rivers of this coast, balsam poplar was only met with for about one hundred miles inland from the coast, where its limit was that of the stratified marine clays of the river-valleys. On the upper East Main River, it was nowhere seen, and it does not appear to grow northward of Lake Mistassini in the western interior. After passing through an area of several hundred miles from Mistassini to Eaton Cañon, on the Koksoak River, balsam poplar is again found growing in the valley of that river and continues to be found at intervals, to within twenty-five miles of Fort Chimo. At the head of Cambrian Lake, large clumps of trees of this species, ten inches in diameter, were observed growing on the low terraces, but elsewhere they were small and straggling. On the lower Hamilton River, balsam poplar is common. Above the Grand Falls it is not found along the river, for upwards of a hundred miles, until the Cambrian area about Birch Lake is reached, when small trees of this species become common, and continue along the Ashuanipi Branch to the end of survey. On the Attikonak Branch, a few small trees were noted between Sandy Lake and the height-of-land to the southward.

Distribution
of balsam
poplar.

Northern
limit.

Thuja occidentalis, Linn. (Cedar) hardly enters the southern limits of the peninsula. It occurs just south of the mouth of the Rupert River, at the foot of James Bay, and does not cross that stream in the eastern course of its northern limit. It is only found about the southwestern bays of Mistassini Lake, from which it extends south-east, crossing the St. Lawrence to the westward of Seven Islands. No cedar trees were seen along the Manicouagan River from its mouth upward.

Distribution
of cedar.

Pinus Banksiana, Lam. (Banksian Pine, Jack Pine, Cypress) is limited in its extension by an eastern as well as a northern boundary.

Distribution
of Banksian
pine.

Northern
limit.

Eastern limit.

It grows freely over the western half of the peninsula, and appears to prefer the dry, sandy drift ridges and rocky hills, where it is often found along with black spruce, as a second growth, covering areas devastated by fire. Its northern limit is the south branch of the Great Whale River, south of which it occurs abundantly to the shores of the St. Lawrence, but does not come quite to the coast on Hudson or James Bay, probably on account of the shore being generally low and swampy. Inland, it is met with abundantly, along the East Main River, to the Long Portage Creek, near its head, in about longitude 71° W. Here a line running nearly north and south terminates the eastern extension of the Banksian pine. About Nichicun only a few small clumps are found to the westward of the lake, and it is unknown to the Indians to the eastward. In the southern extension of its eastern limit, the line runs somewhat east of south and reaches the St. Lawrence in the neighbourhood of the mouth of the Moisie River, being every where common along the main branch of the Manicouagan River.

Distribution
of white
spruce.

Northern
limit.

Picea alba, Link. (White Spruce) is found throughout the wooded area of the peninsula, but it is not everywhere common, and there are several areas where it is rarely found. Its distribution is but little affected by climate or by height above sea level; it appears to depend altogether on the soil. North of the southern watershed, it is confined to the areas of re-arranged drift of the river-valleys and marine deposits along the coast, or to the heavier drift of the Cambrian areas of the interior. Along the western coast, the interior limit of this tree, on the East Main and other rivers flowing into Hudson Bay, coincides closely with the margin of the marine deposits, and consequently does not extend one hundred and fifty miles eastward from that coast. From Lake Mistassini, along the route to Nichicun, no trees of this species were met with, but it is said to grow sparingly about the latter place. A few small trees were observed on terraces between Nichicun and Lake Kaniapiskau. Along the upper Koksoak River, small trees were seen occasionally on its terraced banks to Eaton Cañon. Below this place, the number of trees and their size increased rapidly in the river-valley, and from here to the forks of the Stillwater many of them exceeded eighteen inches in diameter three feet from the ground and were over fifty feet in height. Below the Stillwater, their size rapidly decreased, and the trees died out near the mouth of the Koksoak River, along with the black spruce and larch, of which the northern limit is about co-terminous with that of the white spruce. About Hamilton Inlet, white spruce is abundant on the lowlands, and at the mouths of the Kenamou and Hamilton

rivers many large sticks have been taken out for spars and masts for Good timber. schooners. Here, and along the Hamilton River valley, where unburnt, this tree often exceeds eighteen inches in diameter, and grows sufficiently tall to allow of three good twelve-foot logs being cut out of a single tree. Above the Grand Falls, white spruce is found along the river banks, but is generally small and scattered until the Cambrian area of the upper waters is reached, when it becomes more abundant and grows well up the hillsides. Many of the trees of this region are very stout at their bases, but being short and branching would make poor lumber. To the southward of the Cambrian area, on the Attikonak Branch and the upper Romaine River, very few trees of this species are seen until the latter stream enters its ancient valley, when they become more abundant. They are found everywhere in the valley to the St. Lawrence. In the valley of the Manicougan River, trees of this species attain a large size and are very abundant to Lake Mouchalagan, above which they gradually become fewer and smaller, and die out near the mouth of the Attikopi River.

Picea nigra, Link. (Black Spruce) is the most abundant tree of Labrador and probably constitutes over ninety per cent of the forest. It grows freely on the sandy soil which covers the great Archean areas, and thrives as well on the dry hills as in the wet swampy country between the ridges. On the southern watershed the growth is very thick everywhere, so much so that the trees rarely reach a large size. To the northward, about the edge of the semi-barrens, the growth on the uplands is less rank, the trees there being in open glades, where they spread out with large branches resembling the white spruce. The northern limit of the black spruce is that of the forest belt; it and larch being the last trees met with before entering the barrens. Distribution of black spruce.

Abies balsamea, Miller. (Balsam Fir, or Spruce,) is another species that grows only on suitable soil. It is found nearly to the edge of the barren grounds. Throughout the wooded regions it grows more or less plentifully about the margins of the larger streams and lakes, apparently preferring soil containing considerable moisture and alluvium. Northward of the southern watershed, it is rarely found away from the edges of rivers and large lakes, and is wanting along the portage-routes connecting the larger streams. On the Hudson Bay coast, its northern limit is near the Great Whale River. On the Koksoak River a few trees were seen below the junction of the Still-water. Along the Hamilton River it grows everywhere and was also found growing about the shores of Lake Michikamau. Distribution of balsam fir. Northern limit.

Distribution of larch.

Larix Americana, Michx. (Larch, Tamarack, 'Juniper'), is probably the hardiest tree of the sub-arctic forest belt; it grows everywhere throughout the Labrador Peninsula, and is probably next in abundance to the black spruce. Throughout the interior it is found growing in all the cold swamps, and is always the largest tree in the vicinity. Along the northern margin of the forest, the larch continues as a tree to the very edge, where the black spruce is dwarfed to a mere shrub. The larch of the southern region has been almost totally destroyed by the ravages of the imported, European larch saw-fly (*Nematus Erichsonii*). The present range of this pest extends northward from Lake St. John to beyond Lake Mistassini, and appears to be yearly spreading northward and eastward, but has not yet reached the St. John or Romaine rivers flowing into the Gulf of St. Lawrence.

Destruction by saw-fly.

Forest areas of commercial value.

Areas of forest of sufficient size, with trees large enough for commercial purposes, are confined to the southern watershed and to the lower courses of the streams flowing into the Atlantic or Hudson Bay. It is very doubtful if such areas occur along these coasts to the north of latitude 54°. Much of the timber of the more southern regions is not of the best and would afford only spruce deals, while the greater part could hardly be profitably worked in competition with the western pine; but the time will probably come when the trees of the more favourable portions of Labrador will be profitably worked into lumber, especially if the smaller growths are cut at the same time for the manufacture of paper pulp.

Forest fires.

At least one half of the forest area of the interior has been totally destroyed by fire within the past twenty-five or thirty years. These fires are of annual occurrence and often burn throughout the entire summer, destroying thousands of square miles of valuable timber, to the south of the central watershed. The regions thus devastated remain barren for many years, especially towards the northern limits, and the second growth of black spruce, Banksian pine, aspen and white birch is never as good or as large as the original forest. These

Causes of fires.

fires are due to various causes, but the majority of them can be traced to the Indians, who start them either through carelessness or intentionally. The Naseaupee Indians of the semi-barrens signal one another by smoke made by burning the white lichens that cover most of the ground in the interior, and these signals cause many of the fires. The southern Indians signal in a similar manner, but do not practice it to such an extent as their northern brethren, having found that they are rapidly destroying their hunting grounds. Careless camp fires in dry seasons are another common cause of these forest fires, and many of those ascribed to lightning, if closely traced

would be found to have been set by wandering Indians, who are only careful on their own hunting grounds. From what is seen on the explored routes of the southern watershed, it would appear that at least one half of the forest has been removed by this cause.

The greatest fire of modern times occurred in 1870 or 1871, and swept the country south of the height-of-land, from the St. Maurice to beyond the Romaine River. The second growth is just beginning to cover up the traces of this great conflagration, which ruined the pioneers of Lake St. John, and it will be years before the country is generally again well wooded. The upper Romaine river-valley has been totally burnt over within the last ten years, and the margin of this great burnt area has been extended southward during the summers of 1893 and 1894, so that now practically no green woods exist along the course of this river from the St. Lawrence to its source. The country surrounding the Hamilton River is in a similar state; except patches of original forest, along the lower part of the river-valley and about Hamilton Inlet, only blackened stumps or a small second growth are seen along its course, with an occasional oasis of large green wood to break the monotony. In this region great fires occur annually; that of 1893 covered hundreds of square miles of the table-land between the Hamilton and Northwest rivers. Similar remarks apply to the forests of the western watershed, more than half of which have been burnt.

(Great fire of 1870-71.)

Romaine River.

Hamilton River.

Throughout the forest belt, the lowlands fringing the streams and lakes are covered with thickets of willows and alders. As the semi-barrens are approached, the areas covered by these shrubs become more extensive, and they not only form wide margins along the rivers and shores of the lakes, but with dwarf birches occupy much of the open glades. The willows and birches grow on the sides of the hills, above the tree line, where they form low thickets exceedingly difficult to pass through. Beyond the limits of the true forest, similar thickets of Arctic willows and birches are found on the low grounds, but on the more elevated lands they only grow a few inches above the surface. In the southern region, the undergrowth in the wooded areas is chiefly Labrador tea (*Ledum latifolium*) and "laurel" (*Kalmia glauca*), which grow in tangled masses, from two to four feet high, and are very difficult to travel through. In the semi-barrens this undergrowth dies out, and travel across country is much easier in consequence. In the southern regions the ground is usually covered to a considerable depth with sphagnum, which northward of 51° is gradually replaced by the white lichens or reindeer mosses (*Cladonia*), which grow freely everywhere throughout the semi-barren and barren regions.

- Small fruits. The distribution of small fruits and berries is of some importance and may be recorded here, although they are included in the plant list of Appendix VI.
- Cherry. *Prunus Pennsylvanica*, Linn. (Wild cherry) is found in burnt areas northward throughout the interior to about latitude 55°, where it grows in small bushes, rarely more than four feet high.
- Bake-apple. *Rubus chamemorus*, Linn. (Cloudberry, Bake-apple, Yellow-berry) is found in the swamps everywhere throughout Labrador to beyond the tree limit, and forms an important article of food for the Indians.
- Arctic raspberry. *Rubus arcticus*, Linn. (Arctic raspberry, Dewberry, Eye-berry) grows in the opens, along the banks of northern streams, and is especially abundant on the islands along the east coast of Hudson Bay. It is a much larger fruit, and has a more delicate wine-flavour than the next species.
- Dewberry. *Rubus triflorus*, Richards (Dewberry, Eye-berry) is found along the banks of streams and on the edge of woods northward from the St. Lawrence to about latitude 54°, where it occurs rarely on the banks of the upper Hamilton River and about Lake Nichicun.
- Raspberry. *Rubus strigosus*, Michx. (Red raspberry) is limited to about the same range as the last species, being found in burnt woods as far north as latitude 54°.
- Strawberry. *Fragaria Virginiana*, Duchesne (Wild strawberry) is not abundant in the interior, owing to the absence of grassy glades, or opens; it is only found on grassy banks, at the ends of well-used portages, or in the clearings about the Hudson's Bay Company's forts, as at Mistassini, Nichicun and the abandoned Fort Nascaupée, on the Hamilton River. Along the coast of Hudson Bay, it is found abundantly on the islands, to beyond Fort George, in latitude 54°.
- Indian pear. *Amelanchier Canadensis*, Torr. and Gray (June-berry, Indian pear). Of this species both the *oblongifolia* and *oligocarpa* varieties are found, northward, to the Big and Hamilton rivers. The latter variety is most common, and is much inferior in fruit to the rarer variety. It grows in glades, generally in swampy ground. The first variety is confined to the burnt areas and hillsides.
- Blueberries. Several species of *Vaccinium* are found abundantly throughout the peninsula, growing on the burnt districts of the south, and in the open country of the semi-barren and barren lands.
- Vaccinium Pennsylvanicum*, Gray (Blueberry), is very abundant throughout the southern region, where it grows profusely on the

extensive burnt lands, as far north as the East Main and Hamilton rivers, and is abundant at Nichicun, where the fruit is often destroyed by summer frosts. It was found abundantly along the Koksoak River, nearly to the Stillwater Branch. On the Atlantic coast, it has been found northward to the vicinity of Nain, while on the Hudson Bay coast, it reaches nearly to the Great Whale River. Its fruit is used largely by the Indians, who during the later summer months subsist largely upon it. It is eaten both raw and in the form of jam, and, mixed with a small proportion of flour, it is made into bread or cake.

Vaccinium uliginosum, Linn. (Duck-berry) is a more northern form, Duck-berry. which, on the edge of the semi-barrens, largely replaces the last mentioned species. In the southern portions of the peninsula, it is only occasionally found on the banks and islands of the rivers. In the vicinity of the Hamilton and Big rivers, and northward, it is found growing profusely in the open spaces, along with *V. Pennsylvanicum*, and continues northward into the barren grounds, where it occurs as a small spreading shrub, growing only two or three inches high. The fruit of this species is more acid and firmer than the southern blueberry, and is not as pleasant to the taste, especially when cooked, having then a disagreeable flavour. It is also an important article of food to the Indians and Eskimo.

Vaccinium cespitosum, Michx., is a more northern variety than the last, being found on the summits of the higher hills about the headwaters of the Hamilton River. It continues abundant to beyond the mouth of the Koksoak River.

Vaccinium Vitis-Idea, Linn. (Cranberry, Pomme de terre) is the Cranberry. most important berry of the northern half of Labrador. South of latitude 51°, it is found only on the summits of barren rocky hills, or on barren islands in the larger lakes; but to the northward, as the open barren spaces increase, it soon becomes abundant, and about the Hamilton and Big rivers is very plentiful everywhere, growing on the low ridges of drift, as well as on the rocky hills. It continues to be abundant to the northward of the Koksoak River. Owing to the lasting qualities of the fruit and its improvement by frost, large quantities are gathered annually by the inhabitants, before the ground is covered with snow, for use during the long winter, throughout which the berries keep perfectly, and counteract the ill effects of the constant meat diet of the Indians and other inhabitants. The fruit is found in perfection, immediately after the disappearance of the snow in the spring, and continues good for several weeks, until the juices are dried up by the sun.

- Crow-berry. *Empetrum nigrum*, Linn. (Crowberry) is abundant throughout the semi-barren and barren regions of the peninsula, growing freely on the coast and inland. Where the various species of *Vaccinium* are absent, its fruit is eaten by the natives; but, as it is watery and not well flavoured, it is not esteemed as highly as the other berries. It is a favourite food of the curlew, and is eaten by geese in the early spring.
- List of plants. The lists of plants contained in Appendix VI. show the distribution of the flora of the Labrador Peninsula, including different areas of the interior where collections have been made, and also the Atlantic and Hudson Bay coasts.

POPULATION.

Inhabitants. With the exception of the white settlements along the north shore of the Gulf of St. Lawrence and on the Atlantic coast, and the few whites employed by the Hudson's Bay Company in the interior and on Hudson Bay, the inhabitants of the Labrador Peninsula are either Indians or Eskimo.

Difficulty in making a census. It is very difficult to arrive at more than a rough approximation of the numbers of Indians inhabiting the interior, owing to their habits of roving from one Company's post to another; and the consequent liability to counting the same family several times, if the returns are computed from the books of the various posts, which is the only available data for any exact enumeration.

Number of Indians. From the returns given in the reports of the Department of Indian Affairs, the Indians of the Gulf of St. Lawrence, including those of Lake St. John, numbered 1919 in 1888, and 1725 in 1893. These figures exclude 2860, under the heading of the "Nascopies of the Lower St. Lawrence," which number is the same in both returns. According to the same source, the number of Indians of Eastern Rupert Land is 4016; that of the Labrador (Canadian Interior) 1000, and that of the Atlantic coast 4000. The last probably refers to the Eskimo, but is not so stated. These returns would give a total native population of more than 13,000 persons, if the Indians of Eastern Rupert Land are those of the east coast of Hudson Bay.

In Appendix II., page 336, of the report of the Committee on the Hudson's Bay Company (1857), a return of the native population is given, compiled by the Hudson's Bay Company and others. The total number of natives trading at, and belonging to, the various posts in the Labrador Peninsula is given as 3885 persons; and this estimate, although probably somewhat high, is still much nearer to the native

Indian population than that given above. The population of the St. Lawrence coast is given as 1800 persons, which agrees closely with the Department of Indian Affairs returns for the years 1888 and 1893.* Of the remainder, 400 belonged to posts on the Atlantic coast, where probably a number of Eskimo are included, 950 belonged to the posts of the east coast of Hudson Bay, and the balance, 735, were attached to the posts of the interior. Since this return was made, the food resources and other conditions have changed considerably, and with them the distribution of the Indians.

In 1857, there were seven trading posts in the interior of the peninsula, and at present there are but three, Waswanipi, Mistassini and Nichicun. Fort Chimo, near the mouth of the Koksoak River was not then opened. The policy of the Hudson's Bay Company was then to keep the Indians away from the coast and contact with opposition traders; this has now been changed, and the great body of the natives travel annually to and from their hunting grounds in the interior, to the various coast posts. In consequence, instead of 735 persons belonging to inland posts, at present there are not above 300 attached to these posts. The number of Indians trading at Northwest River and Davis Inlet, on the Atlantic coast, is about 200 persons. At Fort Chimo the famine of 1892-93 reduced the number of Indians in that district from 350 to less than 200 persons. Connected with the posts at Great Whale River, Fort George and Rupert House, on Hudson Bay, the total number of Indians does not exceed 1000 persons, and probably falls considerably short of that number, so that at the highest estimate the Indian population of the Labrador Peninsula does not exceed 3500, and is more likely nearer 3000. Changes in population.

The Eskimo inhabit the coast of the peninsula from Hamilton Inlet northward along the Atlantic coast to Hudson Strait, the east shore of Hudson Bay as far south as Great Whale River, while a few families live on the islands of James Bay. From the meagre returns available, only an approximate statement of their numbers can be compiled. In the census of Newfoundland (1891), the Eskimo are not separated from the white population of the Labrador coast; but, as the number of resident whites is not above 100 persons north of Hamilton Inlet, and as the Eskimo form about one-half the population of that place, from a total of 1191 persons there, and along the coast north of Hamilton Inlet, between 900 and 1000 may be taken as Eskimo. Number of Eskimo. The following estimate of the Eskimo population living on Hudson

*The census return for 1891 gives a total of 1387 Indians belonging to the posts along the north shore of the St. Lawrence, to the eastward, and exclusive of, the Saguenay.

Strait and the east coast of Hudson Bay was supplied by Mr. R. Gray, who was for upwards of ten years clerk at Fort Chimo, and is well acquainted with the Eskimo of Ungava Bay:—From Cape Chidley to Hope's Advance, 51 families; about Hope's Advance, 30 families; from Stupart Bay to Cape Wolstenholme, 80 families; from Cape Wolstenholme to Great Whale River, 80 families. The average Eskimo family is small and rarely exceeds five persons. Taking this as the average, the total population to the west of Cape Chidley would be 1200 persons. This estimate is probably excessive, and 1000 persons would be nearer the number, if not still above it. According to the Newfoundland census of 1891, the total population of the Labrador coast between Blanc Sablon and Cape Chidley is 4106, including the Eskimo already referred to. Subtracting the 1000 Eskimo would leave a resident white population of 3106 greatly increased during the summer months by fishermen from Newfoundland. In 1890, 10,430 men, 2076 women and 828 children from Newfoundland were so engaged, in 854 vessels.

Whites on
Labrador
coast.

According to the Canadian census (1891), there is a white population of 5728, scattered along the north shore of the Gulf of St. Lawrence, to the eastward, and exclusive of those living about the mouth of the Saguenay River, who number 2440.

Total popula-
tion.

To sum up, taking 3500 Indians, 2000 Eskimo and 8800 whites, the total population of the Labrador Peninsula is 14,300, or, roughly, one person to every thirty-five square miles.

The white population along the gulf coast consists largely of French Canadians who obtain a livelihood chiefly from the fisheries, with slight help from fur hunting during the winter. On the Atlantic coast the whites, northward from the Strait of Belle Isle to Sandwich Bay, are largely English speaking, and are either immigrants from Newfoundland, or the descendants of English fishermen formerly engaged in the salmon fishery. Northward of Sandwich Bay, the white inhabitants are, for the most part, descended from Hudson's Bay Company servants, who married Eskimo women and remained on the coast after their services had expired. They are known along the coast as "planters," and gain a fairly comfortable living from the cod and salmon fishery in the summer, and by fur hunting during the winter. They are all deeply in debt to the Hudson's Bay Company and Newfoundland fishing firms for supplies advanced. Having no capital of their own, they are compelled every spring, in order to carry on their fishing, to obtain supplies and nets from the merchants. If the season is favourable, they may be able to pay off their

"Planters."

debts at its close; but, as a rule, of late years they have been going deeper and deeper into debt, owing to the scarcity of fish along the coast where they are accustomed to make their fisheries. The natives ascribe the failure of the fishery to the numerous trap-nets now used along the coast by fishermen employed by the Newfoundland merchants. The use of these nets is said to be contrary to the law of Newfoundland, but, as there is no strict government patrol of the Labrador coast, the law is practically inoperative.

At the close of the fishery, the greater number of the "planters" leave their small houses on the coast, and proceeding to the heads of the various bays, go into winter quarters in their small houses there. During the winter they are engaged hunting fur-bearing animals. These also are not so plentiful as formerly, owing probably, to the large areas burnt over, either from fires accidentally made, or set on purpose by the owners of schooners, who often fire the country along shore, so as to easily make dry firewood for future seasons.

Each "planter" has a "path," or line of traps, often extending fifty miles or more inland, and as these paths cannot be covered in one day, he has small "shacks," or log houses, at convenient intervals along them, where he can pass the night with some degree of comfort. Some of the paths are so long that they require a week to go over and attend to the traps on the way.

During the months of April and May the planters and Eskimo are engaged at the seal hunt. They kill these animals on the ice of the upper part of the inlets, by watching at their holes or cracks, and spearing them when they come to breathe or sun themselves. Formerly the takes were large, but of late years they have been so small that many are abandoning the hunt. As soon as the ice leaves the bays, seals are taken in nets set along shore. The seals are used principally for local consumption, although some skins and a small quantity of oil are exported. The skins are used for outer winter clothing and other domestic purposes, while the fat and meat are preserved for dog food; for, as each "planter" has a team of dogs, varying in number from two to six, and as the Hudson's Bay Company keep a large number of dogs, a great quantity of seal meat is required.

Notwithstanding the decrease in the fishery, furs and seals, the planters make a much better living than many of the poorer people in cities; and, if they were to exert themselves more, and were more thrifty, they might make a comfortable and independent living. As it is, with a reasonable amount of care, thought and labour, they can procure sufficient provisions to keep their families well fed, as in the Food supply.

fall, after the close of the commercial fishery, they can obtain an abundance of brook trout, that swarm at the mouths of all the streams flowing into the sea. At this time, spruce partridges are very plentiful on their migration from the coast inland, while, later, ptarmigan and rabbits are generally abundant. The proceeds of their fishery would easily provide them with flour and provisions, while all living inland might raise a small crop of potatoes; then, the proceeds of their winter's hunt would, in most cases, be ample to supply clothes for a year, and leave a surplus. This is, unfortunately, not the case, and a number of families are often without sufficient food and clothing every year.

Missionaries. For the spiritual benefit of the whites, the Methodist church of Newfoundland has a mission station opposite Rigolet, in charge of the Rev. Mr. Pollock, who resides there a part of the time; the rest of his time being taken up with house to house visitations to the planters. As his district extends to and includes Sandwich Bay, one hundred miles to the south, where there is a large settlement, the time devoted to each family is small. The Episcopal church has a mission school at Sandwich Bay, in charge of Mr. L. Dicks, who also travels from house to house, instructing the children.

Education. In spite of lack of educational advantages, nearly everybody can read and write, and all are very religious. As alcoholic liquors are not openly sold on the Labrador coast, cases of intoxication are exceedingly rare, and many of the younger people do not know the taste of alcohol. On the whole, these people compare favourably with those of more civilized regions, being frugal, moral, willing, good tempered, and naturally intelligent; their only fault, want of thrift and providence, is largely due to their mode of living, absence from any market of competitive labour, and the system of credit and debt under which they live.

**Tribes of
Indians.**

The Indians of the Labrador Peninsula belong to tribes of the Algonkin family. The principal tribes of Labrador are the Montagnais, the eastern and western Nascaupes, and the coastal Indians of Hudson Bay. The Montagnais inhabit the country extending south of a line drawn westward from Hamilton Inlet, to the headwaters of the St. Maurice River. The Nascaupes inhabit the interior country north of this line, or from the bottom of James Bay eastward to Hamilton Inlet. The northern limit of their territory is marked by the Koksoak River, from its mouth to the Stillwater Branch, and by this stream westward to its head on the neighbourhood of Clearwater Lake, and thence westward to Richmond Gulf on Hudson Bay. This line divides the Indian territory from that of the Eskimo, and the boundary is well observed,

the latter keeping far to the north of it, when hunting deer inland, and the Indians rarely crossing it from the southward.

The coastal Indians of Hudson Bay are confined to a narrow margin extending from the bottom of James Bay to Little Whale River, along the east coast.

The various tribes are closely related by intermarriage, and, although using different dialects, have many manners and customs in common. The northern Indians have apparently migrated to their present territory, from a south-west direction, as their language contains many words of the Sauteaux or Ojibway tongue; whereas the southern Indians speak purer Cree. The Nascaupees have traditions that their people originally dwelt far to the south, on the north side of a great river, with the sea to the eastward. They were driven northward by the Iroquois during the wars of the early French régime in Canada. Such was the terror inspired by the Iroquois, who followed them beyond the southern watershed to the shores of Hudson Bay, and eastward along the St. Lawrence to the Natashquan River, that at present they use their name to frighten the children. The writer had two Iroquois as canoe-men on the Big and Great Whale rivers, and could only with great difficulty, induce the native Indians to accompany him inland along with their traditional foes and conquerors. There are several places between Hudson Bay and the Lower St. Lawrence, where great massacres of the natives were perpetrated by the Iroquois.

Close relation
of different
tribes.

Fear of the
Iroquois.

The Montagnais are more or less of mixed blood, having intermarried with the old *coureurs des bois* and the French and English traders. This admixture of white blood is seen in the better physique of the tribe, the men being more muscular and broader than the pure Indian of the interior. As a rule, the men are of medium height, but a few are tall. The women are inclined to obesity as they advance in years, like their sisters of the northern tribes. The western Nascaupees are, as a rule, the tallest men in Labrador, many of them being six feet and over in height, straight and of light physique. The eastern Nascaupees are usually not above five feet six inches tall, slightly built and not at all muscular, being incapable of carrying half the loads of the Montagnais. They are also the dirtiest and most degraded Indians of Labrador. The coastal Indians have apparently a large admixture of white blood, as many of them have blue eyes and the men as a rule have strong beards. They bear in figure and face a certain resemblance to their northern neighbours the Eskimo, being heavily built and unlike the typical Indian. The admixture of white blood would account for this difference of physique, and it may also have

Montagnais.

Nascaupees.

Coastal
Indians.

been induced by their living along the sea coast. Their resemblance to the Eskimo is not likely due to a blood relationship, as the Indians and Eskimo never take wives from one another, nor have sexual intercourse together.

Very little is known definitely about the philology and ethnology of the Indians, and the present account is only from desultory information picked up among them by the writer.

Language.

The language, as before stated, is various dialects of Cree, or a mixture of Cree and Ojibway. The dialects are more numerous than those of the four tribes given above. The Montagnais of Lake St. John speak a somewhat different dialect from that of Bersimis, and it again differs from the dialects of Mingan or Northwest River. These differences of dialect in the same tribe are slight, and are mostly in the slang and interjections. The same differences apply to the dialects of the Nascaupee, Mistassini and Nichicun, differing from that of Fort Chimo, and all from that of Whale River and Rupert House. But these differences are all so small that the Montagnais canoeemen conversed readily with the natives at Mistassini, Nichicun, Fort Chimo and Northwest River, and were only slightly puzzled on the coast of

Religion.

A large majority of the Indians of Labrador are Christians, the Montagnais of the St. Lawrence and Hamilton Inlet being Roman Catholics, while the Indians of the western watershed have been converted by the missionaries of the Church of England. Only the eastern Nascaupees are pagans, and most of them have a faint tinge of Christianity, imparted on hurried visits by the Roman Catholic missionaries, between Hamilton Inlet and Ungava Bay. The christianized Indians are devoutly religious, attending strictly to the offices of the church during the long periods of absence from the eye of the missionary. While in the woods, they keep track of the weeks, ticking the days off on a rough calendar. They do not work on Sunday, and observe the fast days. Notwithstanding their careful observance of the offices, their religion is to a considerable extent leavened with old pagan superstitions, and a sneaking regard is still held for the windago and other evil spirits of their forefathers. It is almost laughable to see the respect with which the most religious of them treat the well-known conjurors or medicine men of the pagan Nascaupees; and they all secretly believe that these persons can, if they wish, work harm by the aid of evil spirits. All the Christian Indians can read and write, those instructed by the English missionaries using a kind of syllabic shorthand, while those under the French missionaries make use of

Conjurors.

books printed in the ordinary way.

Education.

Dishonesty and theft are unknown to the interior Indians ; pro- Honesty.
visions and outfit can be left anywhere inland with perfect safety for
any length of time. Only in a case of absolute starvation will provi-
sions be taken, and then only a small part, for which payment will be
left by the person taking them. It is to be regretted that along the coasts,
where the Indians are in close communication with the whites, their
honesty suffers, and a good lookout must be kept, or property will be
stolen.

As a rule, the Indians have not a strict regard for the truth, and Morals.
speak it only when convenient. The missionaries have improved the
moral and sexual relations of the Indians, but there is still room for
improvement in the latter respect. Marriages are made early, the Marriage.
men taking wives as soon as they can support them, and the women
being given in marriage when they are fourteen or fifteen years old.
Among the Christian Indians monogamy is practised, and the marriage
ceremony is performed by the missionaries, or, in their absence, by the
officers of the Hudson's Bay Company. Among the pagan Indians
many of the men have two wives, and some three or four, according to
the number they can support by their hunt. Continence is not usual.
Widows are in great demand in marriage, and often a young boy is
mated to a woman old enough to be his mother. As a widow inherits
her dead husband's hunting grounds, a marriage with her provides the
second husband with hunting grounds as well as a wife, and in conse-
quence widows are taken by young men without lands. The respect
shown by children to parents is great, and the will of the aged father Children.
is law, even with middle-aged sons, who will not enter into any serious
undertaking without first consulting the head of the family. Children
are never beaten, but soon learn to obey without punishment. As a
rule, the number of children borne by the women is small, rarely
exceeding five. The women become wrinkled and old before they are
forty years of age ; after which they often live for many years. The
men show the effects of age much less than the women, and it is
exceedingly difficult to tell their exact age between 50 and 70 years, as
the hair rarely turns grey. The greatest mortality is due to pulmonary Disease.
diseases, which are induced by exposure to cold and wet, with no
covering on the feet but deerskin moccasins, which soak like blotting-
paper. "Lame back" incapacitates a number of the men, and is
probably due to disease of the kidneys. Complaints of the stomach
are also the cause of many deaths, owing to the weakening of that
organ by alternate periods of starvation and gormandizing. Scro-
fulous sores and ulcers are not uncommon, and appear to be inherited.

Burial.

The dead throughout Labrador are buried in the ground, and, only when death takes place during the winter, is the body placed in a tree until the frost is out of the ground. The clothing, gun and other articles belonging to the deceased are often buried with him, or placed on the grave, when the burial takes place in the woods, and no Indian would touch anything so left, or camp near one of these lonely graves. The dead are mourned for according to the position they occupied, and the grief displayed is deep and sincere. A curious custom was noted in the interior, on the arrival of the various families at the posts in the spring—instead of joyous greetings the women clasp one another and indulge in a period of silent weeping, after which they cheer up and exchange gossip.

Mode of living.

The annual routine of an Indian life is made up of two periods, the short period, from one to three months, spent during the summer at the coast, and the long period passed inland. Those who trade at the inland posts, are engaged throughout the summer transporting to Hudson Bay the fur hunt of the past winter and bringing back the supplies to form the next season's outfit. The amount of supplies is so great and the number of men at these posts is so small, that every one capable of working is enlisted, including half-grown boys and old men. As most of the women and children accompany the brigades of large canoes, in their small canoes, the journey practically amounts to a co-operative scheme of bringing in supplies, and differs only in this respect from the annual visit to the coast of the independent families. The only Indians who do not come in contact with the white traders during the summer, are some eighteen families who reside on the shores of a large lake about two hundred miles above the mouth of the George River. These Indians never visit the coast during the summer, and their only communication with the white traders is during the early spring, when the younger men tramp to Davis Inlet on the Atlantic coast, and there trade their furs for tea, tobacco and ammunition. They do not buy clothing or provisions, and haul their purchases home on long narrow toboggans over the crusted snow. This little tribe of Indians carries on a small trade in the above mentioned articles with the other neighbouring Indians of the interior. As they reside in a district plentifully supplied with caribou, they depend upon these animals both for food and clothing, and are thus practically independent of the traders.

Annual visit to the coast.

The majority of the Indians who go to the coast, congregate at convenient centres in bands of six or more families, and in company descend the rivers in their small bark canoes. The time of the spring gathering is shortly after the ice leaves the rivers, when the fur of the

otter becomes "common." Each family carries with it the packs of furs obtained during the winter, together with most of their movable property. Those living farthest inland are often more than two weeks in descending to the post, owing to the long and difficult "roads" they have to follow. On arrival at the coast, the fur-packs are handed over to the trader with whom the Indian deals, and a valuation being set upon them, the Indian is allowed credit for the value computed in "skins" or "beavers," which are the units of value in the trade—the Fur trade. price of the different furs being reckoned in comparison with a medium sized beaver skin, and the traders' supplies are valued in the same manner. On the St. Lawrence coast this system of barter is falling into disuse, and cash is taking the place of the old beaver as a medium of exchange. The summer season at the posts is passed in visiting friends and in a round of gaiety. Very few of the Indians have been Summer life. induced to cultivate land on their own account, although they sometimes work in the gardens of the traders and missionaries. The only work that they willingly undertake is in canoes, either attending fishing parties or transporting provisions inland. During the summer season a majority live in small cotton tents, but some of the most successful hunters own small log houses, in which they pass the summer. During the month of August, preparations are made for the journey to winter quarters, and by the end of that month most of the Indians leave the various posts.

Owing to the extermination of the caribou in many parts of the country and to an insufficiency of other game, the greater number of the Indians are now obliged to purchase a considerable quantity of flour, and carry it inland to their hunting grounds.

So much provisions, along with other outfit, are now taken by the southern Indians that they have to make two or three trips with their canoes at starting, and often they are more than two months in reaching their winter quarters. In former years, the Hudson's Bay Company and other traders annually advanced the Indians sufficient provisions and outfit to carry on their winter's hunt, and recouped themselves in the following spring. At present, to a great extent, this system of advances has been abandoned, and the Indian only gets such outfit and provisions as he can pay for in cash or fur. The change is due largely to the losses entailed by close competition, and to the dishonest practices of many of the Indians, who instead of delivering their fur to the persons who advanced to them, take it to rival traders and exchange it for cash or other articles—leaving their debts unpaid. The change is consequently justifiable where there is competition in the fur trade, but bears heavily on the Indian, who is naturally improvident

Transport of supplies.

Change in system of trade.

Its relation to the Indian.

and spends the proceed of his annual hunt as soon as he gets it, without thought or care. In consequence, when the hunt is a failure, which is often the case through no fault of the hunter, the poor Indian has little or nothing to buy his outfit with, and departs to the woods improperly supplied. To this cause is due much of the hardship, starvation and death reported among the Indians of the Labrador Peninsula during the past few years. With the exception of the eastern Nascaupes, all the Indians now dress in clothing procured from the trading shops, and many of the southern Indians, having acquired a taste for luxuries of civilization unknown to their fathers, must make large hunts in order to gratify these tastes.

Hunting grounds.

Each family is supposed to own a portion of territory with the exclusive hunting rights to it. The territory is generally divided into three parts, each part being hunted over in successive years, and in this manner the fur-bearing animals are allowed to recuperate. In the southern country extensive fires, too close hunting, and other causes are rapidly exterminating the animals, and the families owning these grounds, in order to obtain a living, are obliged to encroach upon their northern neighbours. As the intruders care little or nothing about keeping up the stock on these lands, the result is most disastrous, and in a few years, if strict laws are not enacted, the fur-bearing animals of the province of Quebec will be practically exterminated, and the Indians, thus left without their only means of subsistence, will be reduced to beggary, or will die off from famine.

Extermination of fur-bearing animals.

Winter tent.

As soon as the hunting grounds are reached and the cold weather begins, the cotton tent is exchanged for the wigwam or "metswap," which is constructed by removing the snow from a circle ten or twelve feet in diameter, about the circumference of which poles six or eight inches apart are planted sloping inwards so as to form a skeleton cone. This cone is covered with cotton cloths, sheets of birch bark, or dressed deer skin, often in part by all three, and a space is left at the top about two feet in diameter for the escape of the smoke. The removal of a pole leaves the space for a door, which is generally closed with an old flour-sack split open, and bound to sticks at the ends to keep it spread out. The bottom of the tent is banked up with snow on the outside, while a thick bed of green boughs is laid over the floor. The fire is built on a few stones in the centre, raised slightly above the ground. Many of the southern Indians have small stoves made out of sheet-iron instead of open fires, and thus avoid the constant smoke which fills the interior, especially when the door is frequently opened.

Before the lakes and streams freeze up, hunting is largely carried on with the gun, the Indians shooting from their canoes beaver, otter, mink and muskrats, and in the burnt areas, where blueberries are plentiful, bears. The northern Indians at this time are engaged in their principal caribou hunt, killing great numbers by spearing them in the rivers, as they pass on their annual migrations. After the rivers are frozen, most of the fur hunt is made with traps; these are either steel traps or dead-falls of wood. The principal animals taken during the early winter are marten, fox and lynx. During the intense cold of December, January and February, the wild animals move about very little and hunting is unprofitable. During this period the Indians do not hunt unless compelled to do so by hunger. In the month of March, the martens are once more travelling, and continue to constitute the principal hunt until the small streams begin to break up, when attention is given to the beaver and otter and, later on, to the bear. In this manner the winter routine is carried out, with the intervals mostly filled in looking for food. Ptarmigan and Canada grouse are killed during the winter, along with rabbits, which are periodically plentiful, while fish, ducks and geese aid in stocking the larder in the spring and fall.

When the St. Lawrence was first discovered, the Eskimo inhabited the north shore of the gulf as far west as Mingan. They maintained their position here until 1600, when the Indians, having procured firearms from the French, waged unequal war on their old enemies and drove them eastward to the Strait of Belle Isle, where the Eskimo maintained a fortified camp on an island near the western end of the strait until 1630. Since then, a gradual retreat has been made northward, and their present southern limit is Hamilton Inlet, which appears to have long been the head quarters of the southern Eskimo, and is named Eskimo Bay on all the older maps. From here these people are scattered along the northern coast to Hudson Strait. Several large settlements are found at the Moravian Mission stations of Hopedale, Zoar, Nain, Okak and Ramah on the Atlantic coast. There are very few families between Nachvak and George River in Ungava Bay, the coast being high, desolate and unfit to sustain a large population. The Eskimo are more numerous along the west coast of Ungava Bay and Hudson Strait, and are found along the east coast of Hudson Bay, and among the outer islands of that coast, as far south as Great Whale River. Of late years, some three or four families have hunted on the islands in James Bay.

Turner* divides the Eskimo inhabiting the coasts of the Labrador Peninsula into three or four sub-divisions, on account of sub-tribal dis-

* Annual Report U. S. Bureau of Ethnology, 1889-90.--Ethnology of the Ungava District, Hudson Bay Territory, Lucien M. Turner.

tinctions maintained among themselves. The names given to these tribes, by Turner, are those used by the Eskimo of Ungava Bay. The first sub-division includes all those dwelling along the Atlantic coast and along the south shore of Hudson Strait to the mouth of the Leaf River, a few miles northward of the mouth of the Koksoak River. These people call themselves Suhinimut, "those who dwell at or in the sun," or the dwellers in the east. The second sub-division embraces the Eskimo dwelling along the south shore of Hudson Strait, between Leaf River and Cape Wolstenholme, at the entrance to Hudson Bay. These people are called the Tahagmyut, "dwellers in the shade," or the western people. By the Hudson's Bay Company they are known as "Northerners." The third sub-division includes those living along the east coast of Hudson Bay, and they are designated the Itivimut, or "the dwellers on the other side." A fourth division may be made of the Eskimo of the outer islands of Hudson Bay, who, according to the traders and missionaries, differ from their neighbours along the coast, both in language and customs. They are known as the Kigiktagmyut, or "Island people." Along the Atlantic coast, as far north as Hopedale, few or none of the Eskimo are pure blooded. To the northward the Moravian missionaries keep the natives from contact with the whites, and in consequence there are very few of mixed blood. In Ungava Bay and on Hudson Bay there are, around the Hudson's Bay posts, many half-breeds, the result of marriage between the employees and Eskimo women.

Improvement
by mission-
aries.

The natives along the Atlantic coast, from Hopedale to Nachvak, have long been under the direct influence of the Moravian missionaries, and, in consequence, have abandoned many of their ancient customs. Polygamy is no longer tolerated among them; in many cases they conform with a fair standard of civilization, and are quite religious, although very superstitious.

On the coast of Hudson Bay, mainly through the endeavours of the Rev. Mr. Peck, of the Church Mission Society, most of the Eskimo have been converted to Christianity. On this coast the missionaries do not reside constantly among the natives, and in consequence these people are very liable to relapse, during their absence, into some of their former pagan habits. The Eskimo of Hudson Strait have not yet been brought under the influences of Christianity, and afford a better chance for the study of their native customs and traits.

Physique.

It is customary to think of the Eskimo as considerably below the stature of the average European. This is not the case with those inhabiting the coasts of Labrador. The males, as a rule, are quite as tall as the average white man, but owing to their broad, heavy build,

they appear shorter than they really are ; and this appearance is enhanced by their wide garments of hairy deer or seal skins. Where seen by the writer on Hudson Bay, and at Fort Chimo, George River, Nachvak, Davis Inlet and Hamilton Inlet, several of the men at each place were six feet and upwards in height, the average height being about five feet six inches. The women, as a rule, are short and stout, and look in their native dress of deer-skin coat, trousers and long seal boots, much shorter than they actually are.

The temperament of the Eskimo differs much from that of the Temperament. Indian, the former being jovial, good-natured and very industrious. They are good workers with tools, and on the Hudson Bay coast the blacksmiths confess that the natives, without the use of a forge, can work and temper iron better than they can. These people, living as they do on the coast, depend largely upon marine animals for Food. and clothing. Their principal food is seal meat, together with porpoise, whale meat and fish. They also kill many caribou, to the north of the Koksak River. For this purpose, they travel inland from the coast, but the pursuit of this animal is chiefly for its skin, used in clothing. The hunters quickly tire of the flesh, it being not fat enough to suit their taste. During the winter, they hunt fur, to purchase what supplies they may need from the traders. The principal furs taken by them are red, cross, black, white and blue foxes, white bears, wolves and wolverines, besides deer and seals. The Eskimo have not as many civilized wants as the Indians, the principal articles of Trade. trade taken in exchange for their furs being ammunition, tobacco, knives and iron, tea, sugar and needles. They do not buy much flour or biscuit, and very little European clothing.

With the exception of the Atlantic coast Eskimo, who live at Habitations. the mission stations in small log houses, the summer camp is made much like an Indian wigwam, save that it has a ridge-pole, and is covered with seal-skins. During the winter, small circular snow houses are used. For travel during the summer, two kinds of boats are used, the kaiaik or men's boat is long and narrow, and formed of a wooden frame covered with seal-skins, leaving only a small circular opening large enough to admit the body of a man. The bow is long and pointed and projects above the water forward, the stern is fuller, and much lower and rounder. This craft is for one man, who propels it with a double-bladed paddle, and it is used for hunting. In these small boats the islanders of Hudson Bay frequently cross some fifty miles of open water to the mainland.

The umiak or women's boat is much larger, and like the former is made from seal-skins stretched on a wooden frame. In shape and size

- it resembles a deep, flat-bottomed punt, and is capable of carrying the heavy seal-skin tent and all the other belongings of a family, when moving from one place to another. In winter, dogs and sleds are used to travel with, the Eskimo not being nearly as good a walker as the Indian. The sleds are made of two runners of wood, from nine to eighteen feet long, held in position, from eighteen to twenty-four inches apart, by numerous cross pieces. The sled is shod during the cold winter months with walrus ivory or whalebone attached to the runners with wooden pegs, or else the bottom of the runner is coated with vegetable mould, which is frozen on and then shaped with a knife or plane so as to resemble the head of a large T rail, both in shape and size. This is coated with a thin skin of ice and answers admirably during the cold unbroken winter. In the spring time, runners of hoop-iron are preferred. During the winter, cooking is carried on in the snow houses over soapstone lamps in the form of a shallow triangular dish, about fifteen inches long and eight inches wide. These dishes are nearly filled with seal oil, and the wick is formed of dry moss placed round the sides. Formerly soapstone kettles were used for cooking, but these are almost entirely superseded by tin or copper kettles purchased from the Hudson's Bay Company.
- Sleds.
- Cooking utensils.
- Disease.
- Marriage.
- The habits of the uncivilized Eskimo are far from cleanly, and they appear to have a decided objection to the use of water except for drinking purposes. In consequence, the principal diseases from which they suffer arise from their filthy habits and the close vitiated atmosphere in their tightly closed houses, laden with the odours of decomposing animal food and other filth. Over half the Eskimo die of pulmonary troubles due to these causes and to exposure. Many suffer and die from scurvy, caused by devitalized blood and their excessively fatty food while remaining sedentary during the winter. As a rule, monogamy is practised, although many of the better hunters among the unchristianized natives have two and some three or four wives. The women are married early, generally at about fourteen or fifteen years and often before that age, and these early marriages result in few and weakly children. The marriage ceremony is very simple. The consent of the parents or other relatives of the girl is obtained by presents or favour, and, if the girl is favourable to the union, she goes with her husband. When the girl refuses, she is soon coerced by her relatives. The marriage tie is easily broken, and it is seldom that a man lives with a woman for a number of years. Jealousy, resulting from a laxity of morals or incompatibility of temper, dissolves the marriage without ceremony, the woman returning to her relations

until taken by another man. The family is usually of two or three children, although there are sometimes eight or ten, but many die in childhood. Like the Indians, the Eskimo never inflict corporal punishment on their children, who without it early learn, however, to obey and respect their elders.

The dead are placed in a sitting position, with the knees drawn tightly up, and the whole body covered with seal-skin or deer-skin. The body is placed in this manner on the bare rock, and is covered with stones to prevent the birds and animals getting at it.

Like the Indians, they believe in a future state, where the spiritual conditions closely resemble those of the material world. As every object is endowed with a spirit, clothing, spears, gun, kaiak and other articles, are deposited near the grave, so that the departed may use the spirits of these articles, in his new existence separated from the body. The spirits of material objects are supposed to be released as soon as they decay and if they are found removed, it is said, that the spirit of the dead has taken them for use in the spiritual world. All objects animate or inanimate, have both a material and a spiritual existence; and there are other spirits, mostly of a malignant character, which can be appeased by gifts.

It is easy to understand that, holding such beliefs, they highly esteem, fear and respect the conjurers, whom they suppose to have power over the various spirits, including those that cause disease and death. The conjurers also claim to influence the movements of the deer and other animals, and are supposed to control the weather. Unlike the Indian conjurer, who performs his incantations concealed in a small tent, his Eskimo confrère invokes and exorcises the malignant spirits openly, or with only his head covered up. Some of the Eskimo while away the time during winter, by making rude carvings out of walrus tusk or bear teeth. The carvings represent various birds and animals, or models of their boats, sleds, or implements. Some of the carvings show considerable skill and artistic taste, especially those made under the direction of the Moravian missionaries.

The Eskimo are very fond of singing, instrumental music and dancing, and readily learn to play the violin. At Hopedale and Nain the natives have orchestral music to accompany part singing in the church services, and many of the Eskimo of the Atlantic coast play second parts on the violin, showing that they have a fair idea of harmony.

FISHERIES.

In the appendices at the end of the present report will be found lists and short notes on the mammals, birds and fishes of the interior of the

Food fishes of inland lakes. Labrador Peninsula, and it remains only to remark here on the value of the inland fisheries. The numerous large lakes of the several watersheds, and most of the rivers, especially those flowing north and east, are stocked with an inexhaustible supply of food fishes of large size and superior quality, including among other species the lake and brook trout, land-locked and sea-run salmon, whitefish, pike, pickerel, suckers and ling or freshwater cod. Along the southern, eastern and northern coasts the cod is taken in large quantities as far as Ungava Bay, which is the present limit where trial has been made for taking this fish. Salmon are found plentifully along the coasts as far as the west side of Ungava Bay, which appears to be the western limit of the Atlantic salmon. Very little is known officially or otherwise concerning the fisheries of that great inland sea, Hudson Bay, and a great amount of wealth may be lying dormant in its waters from lack of knowledge concerning its fisheries. As regards the inland fisheries, owing to the distance from available routes to a market, they will probably never be used to their full extent, and even the best situated lakes will not be fished for many years to come, or until railways are built through the interior. Three large lakes of the interior are known to contain considerable numbers of harbour seals (*Phoca vitulina*), which are completely land-locked, and never visit the ocean.

DETAILED DESCRIPTION OF ROUTES EXPLORED.

Chamouchouan River.

Chamouchouan River.

The Chamouchouan River enters Lake St. John at its north-east corner. It is about three-quarters of a mile wide at its mouth, and is very shallow when the water of the lake is at its lowest stage, there being a difference of twenty-seven feet between the high and low water level of Lake St. John,* owing to its contracted discharges being unable to carry off the great volume of water brought down in the spring by the numerous large rivers emptying into it. The river, in its lower part, is obstructed by three large and several small islands, that extend upwards to St. Felicien, some eight miles from its mouth. Its current for this distance is sluggish, the river flowing between low banks of clay and alluvium. During high water the lake backs up to this point, flooding much of the low lands on either side.

At St. Félicien, there is a small rapid full of large boulders, and for five miles above, the current continues swift, to the first heavy rapid,

*Levels of Q. & L. St. J. Ry.—High water, 353 ft; low water, 326 ft. above sea-level at Quebec.

where a portage is necessary. This portage is 150 yards long, and passes over the bare rocks. Twelve hundred yards above, is the Salmon Portage, where the river falls over two cascades, the upper being a direct fall of fifteen feet.

One mile above the portage, the Salmon River enters from the west. Salmon River. This stream is about fifty miles long, and takes its rise in a number of small lakes, near the sources of the Crôche and Windigo branches of the St. Maurice River.

The third portage is about seven miles above the second. Between them the river is about 500 yards wide and flows with a swift current, the banks, which have been gradually rising from St. Félicien, are now in places above 100 feet high, and are composed of clay overlain by stratified sand.

It is three miles and a half from the third portage to the Bear Portage, where there is a fall of fifty feet. This portage is on the east side, and is a mile and a quarter long. From its upper end to the Little Bear Portage, the distance is a mile and a half. Here, a rocky point jutting out from the east side, causes the river to make a sharp turn, with a fall of about twenty-five feet. The portage is 300 yards long and crosses the point. Bear Portages.

Within the next two miles, there are two other portages on the east side, past heavy rapids, the whole bringing the river up nearly to a level with the surrounding country.

Beyond the last portages there are small rapids at intervals for a mile, then the river widens out to about a third of a mile, and flows with a strong, even current, in a shallow sandy channel, for seven miles, to the thirty-fourth mile from its mouth. Five large islands lie in this portion of the river. They are all low and sandy and are well wooded with swamp ash, elm, balsam poplar and willow. Along the lower parts of this course the banks are low, and the surrounding country flat, with a soil of sandy loam. As the other end is approached, the banks rise gradually, until at the sharp bend to the westward, one mile from the end, those on the east side rise abruptly over one hundred feet above the water, and are composed wholly of stratified sand. At this bend a portage route passes up the steep bank to the flat sandy plain above, which it follows northward through several small lakes on the head-waters of Picouabi River. From there the route passes into Lake Jim, a long narrow body of water that extends northward in what appears to be an old river-valley, until it joins the Washimeska River, which, above the junction, flows in a continuation of this valley, while below it turns eastward, and with numerous rapids and falls empties into the Mistassini River. Sandy soil above the Bear Portage.

After the westward course of one mile, before mentioned, the Chamouchouan River again turns north, and a series of long, heavy rapids begin, the lowest of which is called the Pimonka (last p'iae) Rapid.

Good land
along the
lower river.

The land on both sides of the river, as far as Pimonka, has been laid out into townships, and sub-divided by the Quebec government. The townships of Parent and Normandin are on the east side, while those of Ashouapmouchouan, Demeules and Dufferin are on the west side. The soil along the lower parts of the river is very rich and strong, being formed of a clay sub-soil, with sandy loam on top. Above the Salmon River, the deposits of sand are thicker and the soil is lighter, but still sufficiently good to produce excellent crops of wheat and other cereals.

The Archaean highlands come within a mile of Lake St. John, on its west side. These continue northward, but do not cross the river until the foot of Pimonka Rapid is reached, thus leaving a wide margin of flat land on the west side. On the east side there is a flat clay and sand plain between the Chamouchouan and Mistassini rivers. This plain rises in a succession of terraces from Lake St. John northward.

Settlements.

Settlements extend up the west side of the river about five miles beyond Salmon River. On the east side, they approach close to the Bear Portage, while the road to Normandin, a large settlement along the Picouabi River, passes close to the Little Bear Portage. Advantage is taken of this road to transport canoes and outfit past the rapids and portages below.

From the above, it will be seen that, although considerable settlements exist along the river, there is much good land still unoccupied, especially between the Little Bear Portage and Pimonka Rapid.

Above this rapid, the character of the country and river change completely: the former, instead of spreading out into a flat, sandy plain, is high and rough, with rocky hills that rise from 150 to 300 feet above the river. These are covered with sand and boulder-clay, and are not nearly so fit for purposes of agriculture. The river becomes contracted and very rapid, rising 341 feet in twenty-two miles, including the Chaudière Fall and rapids, where the rise is 120 feet in less than a mile. The Pimonka Rapid is three-quarters of a mile long, and is followed in the next mile by two short ones. Extending from the thirty-ninth to the fortieth mile, is the Deep-bottom Rapid, which cannot be ascended with canoes during high water, owing to the depth inshore being greater than the length of the poles, and also to the steep rocky banks, which render tracking impossible. With the exception of one short rapid, there is quiet water from the head of that rapid to the forty-fourth mile.

At the forty-second mile, the Great Mouchipon River comes in from the west. It is a small stream, flowing in a valley about a mile wide, and draining a number of small lakes to the north-west. A portage route, for light canoes in the spring, passes up this river, and comes out above the Chaudière Fall, thus avoiding the heavy rapid between. From the forty-fourth mile to the Chaudière Fall, twelve miles above, the river is a continuous succession of rapids connected by short stretches of swift current, rendering it necessary to make the whole ascent with poles. At the White-spruce Rapid, near the forty-ninth mile, there is a short portage on the west side past a heavy pitch.

The country becomes more rugged as the river is ascended. The hills rise abruptly from 200 to 400 feet above the water, and, as they were burnt over some years ago, their rocky sides are now only partly wooded with small second-growth aspen, white birch, Banksian pine and spruce, while the standing blackened trunks of the older forest give the whole region an uninviting, barren appearance.

The portage past the Chaudière Fall is nearly a mile long. From its lower end it rises sharply 200 feet to the summit of a sandy hill, and then runs along its edge, to within a short distance of its upper end, where it passes along the rocks near the river. There are here three distinct falls connected by heavy rapids, the lower fall having a sheer descent of sixty feet.

Within half a mile of the upper end of the portage, is another, about 400 yards long, called the Little Chaudière Portage. It passes a deep heavy rapid, impassable with canoes.

A short distance from the head of this portage, the river leaves the narrow rocky gorge in which it has been confined, and its valley broadens, leaving a wide margin of low land on either side. The course of the river can be seen up the valley for over ten miles. The river has a moderate current in a wide valley, bounded by low, rounded, rocky hills, covered with small second-growth timber. Much of the land in this valley appears fit for agriculture.

About one mile above the Little Chaudière Portage, the Chegobich River comes in from the westward. This river is much used as a route by the Indians who travel to or beyond Lake Ashouapmouchouan. By it the distance to that lake is greatly shortened, as this route is the hypotenuse of a right-angled triangle, of which the main river forms the other two sides.

The Chegobich River varies from fifty to one hundred yards in width near its mouth, and is quite shallow. As far as the first portage,

a mile and a half up, the banks are low, and are composed of coarse boulder-clay. The first portage is one hundred and twenty yards long, and passes a heavy rapid; it is followed, a quarter of a mile above, by a second portage, over one mile long, past another heavy rapid, ending in a chute of forty feet. Then follows a mile and a quarter of swift water, with two short portages, to the Penché Portage, 700 yards long, with the Savanne Portage, of 200 yards, a half mile above. Beyond this there are stretches of sluggish water, broken by small rapids for four miles, when a portage of 300 yards passes a chute of twenty-five feet.

From the first portage to beyond Savanne Portage, the country surrounding the river is rolling and somewhat rocky, with small second-growth forest covering it. Beyond the Savanne Portage, the banks are low and sandy, with swampy land extending to the low hills that bound the valley on either side, from half a mile to a mile away from the river. Patches of old forest remain on the swampy land, but by far the greater part is small second-growth trees.

Above the chute, the river for nine miles winds through a wide, swampy valley, its sluggish current being broken only in a few places by short rapids. In this distance a number of small tributaries enter, chiefly from the south-west, where they take their rise in numerous lakes on the eastern slope of the Partridge Mountains. These form a ridge of rounded hills, that appears to run nearly north-and-south and to cross the river near Chegobich Lake.

The river, having now become very small, is inclosed in a narrow valley between rocky hills that rise from one hundred to three hundred feet above it, and in the next two miles to the lake it is much broken by rapids, filled with large boulders, entailing several short portages.

Chegobich
Lake.

Chegobich Lake runs northward for nine miles from its discharge; it then turns sharply to the eastward, and extends in that direction some fifteen or twenty miles. The general width of the southern arm is about one mile. It is said to be very deep and the water is clear and brownish. Only three small rocky islands are found in the southern arm. The lake is surrounded by low rounded hills, highest on the east side, where they culminate in Chegobich Mountain, a bold rounded hill rising 420 feet above the water near the outlet, and forming a conspicuous landmark. The other hills on this side never exceed an elevation of 350 feet, while on the west side they are less than 200 feet. There was more unburnt timber about this lake than had been seen anywhere along the route from Lake St. John; but it is not large, and is chiefly black spruce. From the angle between the

two arms of the lake, a portage a mile and a half long, passes westward over a flat, dry, sandy plain, and ends at a small sluggish stream. This stream has a very tortuous course through a wide swamp. After passing two small lakes, it finally flows into the south-east end of Lake Ashouapmouchouan, two miles and a half from the portage in a straight line, but over seven miles by the crooked course of the river. A few low, rounded hills of gneiss rise out of the swamp, but, apart from these, there is very little solid land, where small black spruce, larch and Banksian pine are found growing.

Lake Ashouapmouchouan is about six miles long with an average breadth of one mile. Its shore-line is broken by a number of rocky points and shallow bays, while the surrounding country, as a rule, is low and flat, with a few ridges, never more than a hundred feet above the level of the lake, which, according to Richardson, is 1184 feet above the sea. The water is not nearly so deep or clear as that of Chego-bich Lake. The surrounding country seems to be highly fertile, and in the clearings about the old Hudson's Bay post timothy grass grows in abundance, while small fruits appear to ripen early.

The Chamouchouan River, above here called the Nikaubau River, flows in at the north-west angle of the lake, and about a mile beyond leaves it again at the north-east corner. The northern part of the lake is silted up with material brought down and deposited by the river, and is a favourite place for nets, great quantities of fine white-fish being caught there.

Above the lake, the Nikaubau River for several miles, to the Pole Rapid, flows with a sluggish current through a low country broken by a few rocky hills. Above the rapid, the land becomes higher and the soil, composed of boulder-clay, rises from twenty to eighty feet above the river, and is broken by an occasional rocky ridge sometimes 200 or 300 feet high. Little Nikaubau Lake is about twelve miles above Pole Rapid portage, and between are a number of short heavy rapids, with a short portage past one of them. This lake is one mile across, and is connected by a couple of lake-expansions of the river with the larger lake three miles above. Lake Nikaubau is four miles long, and from a half to one and a half miles broad. It is surrounded by low and apparently swampy country covered with a medium growth of spruce, larch, balsam fir, Banksian pine, aspen, balsam poplar, and white birch, with a few small cedars. It may here be noted that the ravages of the imported larch saw-fly (*Nematus Erichsonii*, Hartig.) extend to the height-of-land; the greater part of the larch trees have been attacked, and large numbers are already dead. It is learned from the Indians that these trees first showed signs of death

north of Lake St. John, some three or four years ago. The trees north of Lake Mistassini still remain unattacked, but it appears to be only a matter of time before all the larch of Labrador will be destroyed, as the pest is spreading rapidly northward.

The Foam-fall River is the largest stream entering Lake Nikaubau; it flows from the south-west, and enters the lake near its outlet at the south end. There is a route by this river to the head-waters of the St. Maurice River, which was surveyed by Richardson.

Country about
height-of-
land.

A small stream, flowing into the north end of the lake, leads by a chain of six little lakes to the watershed between the St. Lawrence and Hudson Bay. From Lake Nikaubau it is twenty-four miles to the head of the stream and the surrounding country is flat, low and swampy. One hill about 500 feet above the general level, lies close to the watershed and forms a conspicuous landmark.

Short stiff rapids are met with along the stream between the lakes. At the fourth or Branch Lake, the river divides, the larger branch flowing in from the north-east, where it is said to drain a number of small lakes immediately south of Lake Wahwanichi. Owing to numerous rapids and other obstructions it is unused as a canoe route.

Height-of-Land to Lake Mistassini.

The general course of the route from Lake St. John to the height-of-land is about north-west, while the distance is nearly one hundred and sixty miles. From the watershed to Lake Mistassini the general direction is nearly N. 30° E., or almost at right-angles to the former course, the distance being about one hundred and ten miles. On crossing the height-of-land the route passes through three large lakes before reaching Mistassini. These lakes are named Obatogaman, Chibougamoö and Wahwanichi, and they are connected with one another by portage-roads passing through small lakes and the streams flowing from them.

Elevation at
watershed.

The height-of-land, according to Richardson, is here 1360 feet above sea-level. It is crossed by a portage of half a mile, ending at a small stream that flows into Lake Obatogaman, five miles distant. The fall to the lake is one hundred and fifty feet. The surrounding country is uneven and sandy, and supports only a small growth of black spruce and birch.

Lake Obato-
gaman.

Lake Obatogaman is very irregular in outline, being broken up into a number of deep bays by long narrow points; its surface is also crowded with innumerable small rocky islands to such a degree that

navigation without a guide is almost impossible. The lake is estimated to be about twelve miles long from north-east to south-west, and about ten miles broad. Its shore-line must considerably exceed one hundred miles in length, owing to the great irregularity in its shape. The water is not very clear, and as a rule appears to be shallow. The outlet is in the south-western part of the lake, and forms a branch of the Nottoway River, which empties into Rupert Bay, the south-western extension of James Bay. Whitefish, pike, pickerel and suckers are ^{Fish.} caught in abundance here, and sturgeon are also said to ascend to the lake, and are taken at certain seasons in large numbers near the outlet.

The surrounding country, except toward the south, is generally flat ^{Character of} and low, with ridges of low granite hills rising above the general ^{country.} swampy lands. The soil is thin and sandy and the timber small along the shore and on the islands. It consists chiefly of black spruce, along with balsam fir, white birch, Banksian pine and larch. The canoe route crosses the lake in a north-west direction for ten miles, between islands and past long points, to a narrow bay, which is followed north-east four miles to the first portage on the route to Lake Chibougamoo.

The portage-route is nine miles long, and first passes up a small stream falling into the head of the bay. Along this stream three portages are made past rapids, and then a portage leads from the small swampy lake at its head, to another small lake which discharges into Lake Chibougamoo. Following this sluggish stream four miles, through a swampy country with low hills of rock rising at intervals, the south-west bay is reached. Along the portage-route most of the ^{Timber.} timber has been burnt off, leaving only clumps of black spruce and larch growing on the lower swampy ground. The level of Lake Chibougamoo is forty feet above that of Obatogaman. Its greatest ^{Lake Chibou-} length is about twenty-five miles, from N. 30° E. to S. 30° W., and it ^{gamoo.} is over six miles wide in the broadest part. The southern end is divided into two bays by a narrow point, three miles and a half long. A high rocky ridge projects twelve miles from the northern end, dividing that portion of the lake also into two bays, of which the eastern is the larger, being about twelve miles deep and four miles broad. The western bay is seven miles long, and is very irregular in width, being a succession of small lakes connected by narrows. The lake has on its western side two outlets, about three miles apart. The northern one is near the mouth of the north-eastern bay. They are both only about 200 yards long, and the water falls twenty-five feet into another lake lying parallel to Chibougamoo, and separated from

it only by a narrow rocky ridge. This smaller lake is twelve miles long, and from one to two miles wide. The lake is well stocked with large lake trout and whitefish, and its water is very clear and deep. From it flows another branch of the Nottoway River, which unites with one from Obatogaman some considerable distance to the south-west.

Character of
country about
Lake Chibou-
gamoo.

Lake Chibougamoo is studded with numerous low rocky islands, especially along its eastern side and in the north-east bay; a few are also scattered up the western half, as an apparent extension of the ridge forming the southern point. The shores of the lake are low, and are either formed of solid rock or of large rounded boulders, often found piled up in low walls by the action of the lake ice. The land rises gently from the eastern side to the height-of-land some eight or ten miles distant.

Hills.

The ridge between the two lakes, on the west side, is low in its southern part, but between the two discharges rises to a height of 250 feet, in a bare rocky hill, called Paint Mountain, from the rusty colour of the rocks, due to the decomposition of iron-pyrites in them. The north-west bay is surrounded by high rocky hills, arranged in sharp ridges parallel to the direction of the lake. These culminate in the Sorcerer and Juggler mountains. The former is situated near the end of the point between the two northern bays, and is estimated to rise 425 feet above the water; the latter lies a short distance to the north of the head of the north-west bay; it appears to be somewhat higher than the other, and ends in a sharp cone, having perpendicular sides fifty feet high, and is probably composed of massive diorite. From its resemblance to the tents used by the Indian conjurors, it has been called the "juggler's house," and is supposed to be the dwelling place of evil spirits. The outline of the hills in this locality is sharply serrated, in marked contrast to the rounded outline usually seen in the Laurentian hills. This difference is probably due to the nature of the rocks forming the hills, which are chiefly a soft, green chlorite or altered hornblende schist easily affected by the weather. The timber about the lake is larger and better than at Lake Obatogaman. Black spruce predominate; white spruce, balsam fir, larch and Banksian pine also occur, together with medium-sized birch, aspen, and a few cedars. The higher country at the north end has been mostly burnt over, and is covered with small second-growth aspen, birch and Banksian pine.

Timber.

From Lake Chibougamoo to Lake Wahwanichi, the distance is four miles, the portage-route passing from the head of the north-west bay up, over a burnt hill about 300 feet, to a small lake, and thence through three other small lakes, by intervening portages, to Lake Wah-

wanichi, which is about 200 feet higher than Lake Chibougamoo. The country passed through by the portage-route is rough and rocky, and, as all the green wood has been burnt off, it presents a very barren appearance. Lake Wahwanichi lies parallel to Lake Chibougamoo. It is twenty-four miles long, while its breadth varies from half a mile to four miles, with an average of one mile. The south-west end is divided into a number of long parallel bays by narrow rocky ridges, which rise from fifty to 200 feet above the surface of the lake. There are three of these bays on the western side, and one on the east side. The former are all about four miles deep, and vary from a quarter to half a mile in width; the eastern one is nearly six miles long. From the mouths of these bays, the main body of the lake to the northward is less than a mile wide, for five miles, when it gradually expands and is divided into two bays by a low narrow neck of land connecting a rocky peninsula with the mainland. The north-west bay is some three miles deep, and its head is only a few miles from one of the southern bays of Lake Mistassini. In winter the route between these lakes passes up this bay, and thence a short distance over low hills to the valley of a small stream falling into the Mistassini. The north-east bay is deep, and narrows to less than a quarter of a mile at its head, where the discharge flows out towards Lake Mistassini. Towards its southern end, the lake appears to be shallow, but in the narrows and northern part it is quite deep. There are only four or five small islands on the lake. Its water is clear and cool, and it abounds with fine whitefish and lake trout. In its northern part the inhabitants of the Hudson's Bay Company post at Mistassini make their fall fishery, and take in nets an immense quantity of lake trout averaging six pounds in weight. On the north-east side of the lake, the country rises gradually some 300 feet to the height-of-land, which skirts that side of the lake at a distance of from three to six miles. In only a few places along this shore is the bare rock seen, the soil being made up of thick layers of fine glacial drift, composed largely of debris of the limestone found to the northward about Lake Mistassini. This forms an excellent soil, as can be judged from the number of large trees upon it. The south-west side of the lake is more rocky. At its southern end and along the narrows, the rocky shores rise abruptly from fifty to 200 feet above the surface of the lake. The shores of the north-west bay are low, but the western side of the north-east bay is high and rocky, rising near the outlet 350 feet above the water.

Lake Wahwanichi.

Fish.

Excellent soil.

Much of the country surrounding the lake has been burnt. What Timber remains of the old forest, as already stated, is of good size, and trees

eighteen inches in diameter three feet from the ground, are not uncommon, while the general average is larger than that of any district seen northward of Lake Ashouapmouchouan. Black spruce, white spruce, balsam fir, larch, Banksian pine, white birch and aspen grow abundantly on the unburnt tracts along the eastern shore, and cedar of medium size is found close to the edge of the water.

Lake Wahwanichi discharges into the south-west bay of Lake Mistassini by a small stream four miles long. In this distance there are a number of small lake-expansions connected by rapids and falls, to pass which three short portages are necessary, the total fall being sixty feet. The height-of-land passes close to the river on the south side, while the country is slightly broken to the north.

Lake Mistassini.

Early narratives.

Lake Mistassini is the largest and by far the best known lake of the Labrador Peninsula. Tales regarding its great size were told by the Indians of the lower St. Lawrence to the earlier pioneers, and the first explorers of the region brought back exaggerated accounts of the extent of the lake, derived from like sources of information and not from actual observation. Quite recently similar stories excited the imaginations of various writers in the public press, and numerous speculations were indulged in regarding the magnitude of this mysterious body of water, which, by some, was held to be even greater than Lake Superior. When at last a survey of the lake was completed in 1885, there remained some persons who refused to give up their belief in its supposed great size, asserting that only a bay had been surveyed and that the lake stretched out indefinitely beyond, far to the northward, notwithstanding the fact that branches of the East Main River rise a short distance northward, and that other branches extend to the eastward, over two hundred miles beyond the northern end of the lake.

Survey.

Position.

Although Lake Mistassini does not reach the size ascribed to it by many, it is still a very large body of water, situated between latitude 50° and $51^{\circ} 24' N.$, and longitude $72^{\circ} 45'$ and $74^{\circ} 20' W.$ A straight line drawn from the south to the north end of the lake would run about $N. 30^{\circ} E.$ The lake itself has a perceptible curve between its ends, with the concavity of the curve towards the south-east; the shore-line nearly coincides with an arc of a circle, so that the general trend of the lake changes gradually from north in the southern portion until at the northern end its direction is north-east. The greatest length in a straight line, between the heads of the north-east and

Size.

south-west bays, is roughly one hundred miles; the average breadth of the main body is twelve miles, and it varies but little from that measurement. A low, narrow, rocky point extends out from both the north and south ends of the lake, dividing each end into two deep bays. Between the points, and formed by the same rocky ridge, there is a continuous chain of low islands; these overlap one another, so that only in a few places along the shore is a view of the opposite side obtained. A slight lowering of the present level of the lake would connect these islands and points, so as to form two lakes, as the water between the islands is quite shallow, in marked contrast to the Islands. depth between the islands and the mainland on either side. There the depth averages over 300 feet, but in some places exceeds 400 feet. The water is very clear, and the temperature of the main body rarely if ever rises above 50° Fahr.

The south-east bay is called Abatagush. It is three miles wide at Bays. its mouth, and from there gradually lessens for six miles to the Big Narrows (Chabatok), where, for about a quarter of a mile, it is not over two hundred yards wide. Again expanding to an average breadth of nearly two miles, it extends to the south for eleven miles, where it is subdivided into two arms by a long narrow point.

The eastern arm, called Cabistachuan Bay, averages a mile and a half in breadth, and runs south nine miles, and then east four miles to its head, where a portage leads to the Little Perch River. This stream drains a number of small lakes to the south-east, and is used as a route to the head-waters of the Chief River, the main branch of the Chamouchouan.

The western arm is larger and more irregular than Cabistachuan Bay. From the end of the dividing point, where it is two miles wide, it gradually narrows for four miles, so that along the last half-mile it is only about fifty yards across; this part is called the Little Narrows. Passing the narrows, the bay expands to one mile in width and runs a few degrees east of south for five miles; then it widens out to four miles, and continues on the same course eight miles further, to the discharge of Lake Wahwanichi that comes in at its head. Where the bay widens, there is on the western side, an arm called Sassikan Bay, that runs due north four miles, and is nearly parallel to the main body. Four miles from the head of the bay, a narrow point stretches out three miles from the eastern shore, and almost meets a shorter point from the western side, leaving only a narrow channel between. This point is called Eliquabit, and on it was situated the old King's Post of the North-west Company. The Hudson's Bay Company's post is Trading posts. established on the east side, just inside the Little Narrows.

Fisheries.

The south-west or Poonichuan Bay, for a distance of twenty miles from its entrance, has an average breadth of five miles, and its shore-line is broken by a number of smaller bays, from one of which a portage of two miles leads to Abatagush Bay, reaching it near the Hudson's Bay post. This portage is much used, as it obviates a canoe trip of nearly fifty miles, around the point to the spawning grounds in Poonichuan Bay, where immense quantities of whitefish are taken in nets during the spawning season in October. After the first twenty miles the bay narrows to less than half a mile, and extends in a south-west course for over fourteen miles, a small river coming in at its head.

The bays at the north end of the lake are not so deep as the southern ones. The distance from the end of the point to the head of the north-west bay is fifteen miles, and its average breadth is rather more than four miles. The north-east bay extends nineteen miles from the same point to its head, and has an average breadth of four miles.

Besides the great bays already described, many smaller ones indent the shores of the lake, especially on its west side, where the coast-line is very irregular and many islands occur.

Character of shore-line.

As a rule, the shore is rocky, with only a steep, narrow bouldery beach, and moderately deep water close in. On the east side, the shores and islands are formed of limestone, that dips at a low angle towards the south-east; consequently, beaches facing in that direction shelve gradually into deep water, while those with a western aspect are generally cut off perpendicularly with deep water close up to them. On the west side of the lake, the limestone is only found on the outer islands and points, where similar conditions exist, but the greater part of the shore-line here, being formed of gneiss, perpendicular faces are wanting and the slope is more even in all directions. In some places no rock is seen, and then the beaches of the islands and mainland are formed of boulders, often piled up by ice in low ridges close to high-water mark.

Surrounding country.

As before stated, the escarpment forming the height-of-land passes close to the southern end of the lake, and continues on in a north-easterly direction at an angle to the trend of the lake, so that it is soon a considerable distance to the eastward as it is followed towards the north. The general height of the escarpment appears to be about 300 feet above the lake, but some points may rise to 500 feet. The only other elevation of any consequence, is a range of hills that lies about five miles beyond the north end of the lake, and from there appears to trend away to the westward. Its highest point is not over 500 feet. There is also a

limestone ridge running along the eastern side of the lake which seldom or never rises 100 feet above the water, but often presents a perpendicular face. This ridge separates Lake Mistassini from Lake Mistassinis. On the west side, the country is generally low and swampy, being broken by rounded gneiss hills, never over 100 feet high, and generally less than 50 feet.

The principal rivers flowing into Lake Mistassini, are named the Rivers. Temiscamie, Papaskwasati, Tokwaoio and Wabassinon. The Temiscamie River is the discharge of Lake Mistassinis, and is the largest stream entering the lake, coming in on the east side, about twenty miles from the north end. It is only two miles long, and as the difference of level between the two lakes is 55 feet, the river descends in a continuous heavy rapid, through a shallow limestone gorge. The Papaskwasati and Tokwaoio rivers are large streams flowing into the heads of the north-west and north-east bays respectively. Both come from the northward, and rise near the head-waters of the Tichagami Branch of the East Main River. A canoe route to Nichicun is said to pass up the Tokwaoio River, and to cross from its head to the East Main River. The Wabassinon River is a smaller stream flowing into the lake on the west side, nearly opposite the mouth of the Temiscamie River, and draining an area of country to the north-west of the lake. Besides these larger rivers, there are numerous smaller streams that rise in lakes and swamps in the surrounding region; notably the discharge of Lake Wahwanichi and the Little Perch River, both flowing into the southern part of Abatagush Bay.

The soil of the region about Lake Mistassini is made up of boulder- Good Soil clay, derived from the disintegration of the neighbouring rocks. Large Laurentian and Huronian boulders, with blocks of limestone, are scattered about in profusion. The finer material of the soil is sandy clay, with a large percentage of finely divided and intimately mixed limestone, especially about the southern and eastern shores of the lake.

The climate of the country surrounding Mistassini is such as to preclude the possibility of its ever becoming an important agricultural region, chiefly owing to the prevalence of summer frosts. At the Hudson's Bay post, a most favourable locality, the average temperature of the three warmest months is about 60° Fahr., but, unfortunately, no summer passes without severe frosts in June and August, which cause great damage to the potato crop grown there.

Snow covers the ground from the middle of October, and remains until the middle of May, all the smaller lakes being frozen over during that period. Owing to its great depth and consequent slow change of

temperature, the main body of the lake rarely freezes over before the 20th of December, and it breaks up a couple of weeks later than the smaller lakes and bays in the spring. From the same cause, the general summer temperature of the region surrounding the main lake is lower than that about the post, and even in the month of July, in the swampy lands adjacent, the soil is frozen solid within a few inches of the surface.

Timber.

Covering the higher ground towards the southern end, white and black spruce, balsam fir, Banksian pine, aspen and white birch are found, some trees having a diameter of eighteen inches three feet from the ground. Similar trees of smaller size are found along the limestone ridge on the eastern side. On the western side, where the Archean rocks occur, the soil is scant and sandy, and, in consequence, the trees are much smaller. They are chiefly black spruce and larch, along with small Banksian pine, balsam fir, aspen and white birch. Black spruce and larch alone grow in the swamps, and also form a fringe along the shores and islands of the main body of the lake, where the sweep of cold winds probably interferes with the growth of other species. Cedar reaches its northern limit at the southern end of the lake, where only a few stunted trees are seen.

Fish.

Fish of various kinds and of large size are caught in abundance throughout Lake Mistassini. Lake trout are taken weighing from four to forty pounds, brook trout up to six pounds, whitefish to fourteen pounds, and pike, pickerel, red and white suckers and chub of correspondingly large size. These fisheries would prove of great value if access to them could be had by railway, as the supply is practically unlimited here and in the adjoining large lakes.

Animals.

Caribou and moose, once plentiful in the region, are almost extinct, and can no longer be relied on as a source of food by the Indians, who now live wholly on fish, rabbits and the fur-bearing animals. Of these beaver and bear are the most plentiful, the former being still found in considerable numbers in the small lakes and streams tributary to the lake. Black bears are common on the extensive areas of burnt land on all sides of the lake, but most especially to the south-west. Besides these, marten, mink, fisher, otter, lynx and foxes are taken in large numbers, the fur of the marten being particularly dark and valuable.

Indians.

There are about twenty-five families of Indians belonging to this post. Very few are now pure-blooded, being mixed with the whites, who have traded in the region for the past one hundred and fifty years. In the spring all the able-bodied men are employed in the large bark canoes that descend the Rupert River to James Bay with the hunt

of the previous winter, returning with the outfit of goods and provisions for the coming year. The canoes depart about June 20th, and return about August 20th. As nearly all the women and children accompany the large canoes in their own small craft, very few persons remain about the post during the summer, and as a consequence parties from the outside find it impossible to obtain guides or other assistance there during that period. Those who remain live altogether on the fish caught from day to day, as only sufficient provisions are brought in to supply the post during the winter and to provide for the men engaged transporting the furs to Rupert House. From these causes, the exploration of central Labrador is attended with many difficulties, especially as the country cannot be depended on to supply any food during the summer months, and consequently provisions to last the entire season must be brought in from the coast, up very rough and rapid rivers at great cost and loss of time.

Lake Mistassini, as before stated, lies to the eastward of Lake Mistassini, from which it is separated by a ridge of limestone varying from two to six miles in width.

The difference in level between the two lakes is fifty-five feet. The smaller lake is about sixty miles long, extending from opposite the north end of Mistassini to a place east of the Big Narrows. In its northern part, the lake is about six miles wide and is free from islands or bays, but south of the discharge it narrows considerably and splits up into a number of deep bays, while its surface is covered by numerous low islands. These are formed from limestone reefs running parallel to the direction of the lake, and are most numerous about the outlet and between there and the Temiscamie River which flows in on the east side some three miles south of the outlet.

The water of the lake between the rivers is brownish and not clear, Fish, in consequence of the impurities brought down by the river. In other parts the water is clear, deep and cool. Large fish, of the same species as those taken in the great lake, are also abundant here.

The land on the west side of the lake is low, with rocky shores of flat limestone. The country to the eastward is higher, and consists of a plateau formed of limestone, which separates the lake from the Temiscamie River. The face of the plateau fronting the lake is steep, and has in places a perpendicular cliff of limestone rising from 50 to 200 feet above the water.

The hills mentioned as bounding the north end of Lake Mistassini, also extend part way across the north end of this lake, with an interval of low ground to the north-east, where a portage of less than two miles

crosses to the Temiscamie River. This river is the only important one falling into the lake. It takes its rise to the north-eastward along the northern side of the watershed separating it from the head-waters of the Mistassini and Peribonka rivers flowing into Lake St. John. It passes through Lake Temiscamie, a large body of water near the height-of-land, and then flows south-west twenty miles, to within a short distance of the head of Lake Mistassini, when, instead of entering the lake, it keeps to the eastward of the limestone ridge already mentioned and flows within a short distance of and parallel to the lake for nearly twenty-five miles, where it falls into a small bay on the east side.

The climate, soil and timber of the country surrounding Lake Mistassini are similar to those of the eastern side of Lake Mistassini.

Lake Mistassini to the East Main River.

Rupert River. From Lake Mistassini, the route to the East Main River first descends a branch of the Rupert River for fifty miles almost due north, and then leaving that stream passes north-westward, through a number of small lakes, to and down a small tributary into the East Main River. The distance between the two rivers is fifty-eight miles.

Contracted
discharge of
Lake Mistassini.

The Rupert River forms the discharge of Lake Mistassini. It leaves the lake on its west side, thirty-five miles from the head of the North-west bay. The outlet is at the bottom of a small bay, where the river flows out, over a ledge of gneiss, forming a small rapid. Here the stream is not over one hundred yards wide, and is hemmed in by rocky banks. This contracted discharge is insufficient to carry off the waters poured into the lake by the numerous large rivers previously mentioned, and as a consequence the level of the lake rises during the spring, and reaches its highest level about July 15th, after which the water slowly subsides. The period of lowest level is about the middle of May, or just before the spring freshets, so that the lake rises much more rapidly than it falls, making the volume of water in the Rupert very constant in comparison with that of other rivers flowing into Hudson Bay. On leaving the lake, the river flows almost on a level with the surface of the surrounding country, widening out into deep bays and separated into numerous channels by low rocky islands. For the first eight miles of its course, it flows south-west, or roughly parallel to the shore of the lake, and so close to it that at the end of the distance a portage of less than 200 yards leads from a bay in the lake to the river. Below this portage for two miles, the river continues between rocky banks, with a swift current, and then flows out into a lake-expansion extending westward more than ten miles, and varying from one to three miles in breadth.

The river flows out of this lake by two main and several smaller channels separated by large rocky islands. The two main channels are soon joined by the smaller ones, and then form large rivers, separated from each other by a very large island, and not uniting again for over 100 miles.

The western channel is followed by the Hudson's Bay Company's Two channels. brigade in going down to Rupert House. This channel is descended in a north-west direction about fifty miles, where the route passes from the western end of an expansion called Lake Miskittenau into a chain of lakes on the Marten River, a small branch which joins the Rupert over 100 miles below.

The eastern channel forms part of the route to the East Main River. It runs comparatively straight for fifty miles, having a general course a few degrees east of north, and leaving the above-mentioned lake-expansion at its eastern end, by a number of channels on its northern side. For five miles it is obstructed by innumerable small rocky islands, and is so deeply indented with bays, that were it not for the strong current the stream could not be easily followed. Near the end of this distance the river narrows to a general width of less than a quarter of a mile and passes over two small rapids between islands. For the next five miles the average breadth of the river is 300 yards, and it flows with a steady, swift current to a small rapid, below which the breadth increases to nearly half a mile, and continues so for two miles to a heavy rapid, that falls twenty feet in 200 yards.

Islands in
Rupert River.

The portage past this rapid is a quarter of a mile long, and runs on the summit of a ridge of boulder-clay. The crest of the hill is about 150 feet above the water, and is so narrow and sharp that there is only room for the portage-road on it.

Below the portage the river is about 300 yards wide for five miles and a half, with a strong current and numerous islands. It then expands to an average width of half a mile, and is quite deep, with a sluggish current. These conditions continue for seven miles, when, turning sharply westward, the channel contracts and the stream falls twenty-five feet, over a chute, into the head of Kachikakakuiats or Pinched-neck Lake. This lake extends north-westward ten miles, and in its widest part is about two miles and a half across. The river flows out on the west side five miles from the inlet, and thence runs in a westerly direction to join the other main branch, some fifty miles farther down.

Pinched-neck
Lake.

From Lake Mistassini to the first portage, the country surrounding the river is very flat, with no hills over 150 feet high. The river appears to have no channel proper, merely filling the depressions and fol-

Following the general slope of the country. The islands, shores, and a greater part of the high land are rocky. The depressions where they are not occupied by swamps, appear to be filled with broken rock and boulders, while the finer material of the drift has to a great extent been carried away, not enough remaining in many places to fill the interstices between the heaped-up boulders. The boulders and broken rock are also profusely scattered over the rocky hills and in the river-bed. What soil remains is poor, thin and sandy, supporting only a scant stunted forest growth of black spruce, larch, aspen, and white birch. These trees never exceed forty feet in height, or ten inches in diameter. The underbrush in the low-lying portions is "laurel" (*Kalmia glauca*) and Labrador tea (*Ledum latifolium*), while the higher ground is covered with white reindeer moss. The growth of trees in this region is exceedingly slow, as may be seen from the length of time required to cover areas burnt over years ago, and where now only a scattered growth of black spruce and Banksian pine is springing up.

Timber.

Burnt country.

Below the first portage, the river flows in a valley cut transversely through several ridges that appear to run east-north-east and west-south-west. These hills, as the river is descended, rise gradually from 100 feet to 400 feet in the neighbourhood of Pinched-neck Lake, where they occupy both sides of the lake. Along this lower part of the river more than half the country has been burnt over, thus removing all the trees and vegetable soil, and leaving only the bare rock and scattered boulders, giving to the region a very barren, desolate appearance.

Portage-route between Rupert and East Main rivers.

The portage-route between the Rupert and East Main rivers leaves Pinched-neck Lake at its western end, and there passes, two miles up a small stream through four small lakes (1, 2, 3, 4) connected by short portages. Then a portage of 200 yards leads to lake No. 5. This is one mile long, and is connected by a portage of 500 yards with a larger lake No. 6, which drains into another small branch of the Rupert. This lake is full of small islands and has numerous little bays. It is followed three miles and a half northward to its discharge, where a great mass of boulders, 200 feet wide, separates it from lake No. 7. The outlet of this last lake is close to the inlet, and is said to flow westward through a chain of small lakes to the Rupert River.

Passing northward for a mile and a half, the route then turns westward for one mile, into a bay, and then northward again three-quarters of a mile, to a portage of 800 yards which leads to lake No. 9, which is about a mile long and three-quarters of a mile wide. It crosses this lake to another portage of 800 yards through a swamp, ending in a

slightly larger lake, No. 10, which is followed N. N. E. one mile and a quarter to its head, where a portage of 400 yards passes over a boulder-ridge 200 feet high, and ends in a broad shallow stream. Another branch of the Rupert River, which is one mile and a half to the eastward, flows out of a large lake, No. 11. The western end of this lake is crossed, and a short portage made along a small stream flowing into it. This stream is followed northward about two miles and then turns directly west for another two miles, where two short portages, with a pond between, lead to lake No. 12. This lake is followed north-west for two miles, when a portage of 200 yards is made to lake No. 13, at the head of the Kawachagami or Clearwater River, a small branch of the East Main River. Following this lake two miles to its outlet, a portage of half a mile ends at the head of the eastern bay of Clearwater Lake.

This lake is roughly triangular in shape, having east, west, and north bays, with minor ones. Its water is brownish, clear, and moderately deep. Islands are numerous especially at the end of the north bay, where the shore-line is rocky and irregular. From east to west the lake measures about seven miles, and about three miles and a half from north to south. Two small lakes with narrows between, lead from the north-east corner of the north bay, to a long lake lying to the westward, about four miles from Clearwater Lake. The outlet is on the east side of the north bay. It is very small and narrow, and as it turns off at right-angles to the direction of the bay, cannot be seen until entered.

Clearwater
Lake.

Leaving the lake by the outlet, the river flows directly east for two miles and a half; then it bends sharply to the north-west, around a long narrow point and enters a small lake. Following this lake northward for two miles, a short portage is made past a small rapid at its discharge, after which the course is west, for two miles and a half, through a small lake-expansion to another short portage past a fall of eight feet.

The river thence flows northward in a shallow, sandy channel for four miles to another small lake, a mile and a half long, with a rapid at its outlet. The river, now about twenty yards wide, flows with a sluggish current in a very crooked channel through an extensive swamp, until it empties into Tide Lake on the East Main River. The distance between the last two lakes in a straight line is five miles, while by the river it is considerably more than double that; the general course is W. N. W.

From Pinched-neck Lake to Clearwater Lake, the country passed through by the portage-route is broken by roughly parallel ridges of

Character of
country along
portage-route.

rocky hills. These hills rise from 200 to 500 feet above the surrounding water level, and appear to run nearly north-east and south-west. The hills of each chain are usually connected with one another by sharp ridges of coarse boulder-clay. These ridges are highest and thickest on the south-west side of the hills, where their material seems to have been accumulated in the lee of the rocky obstructions to the ice during the glacial period. Like the sharp ridge described at the first portage on the Rupert River, these ridges are largely composed of boulders and semi-angular blocks of gneiss with very little finer material, and have the same characteristic narrow crests, sloping on either side.

Between the ridges the lower ground is often swampy and covered with a network of small lakes. From a rocky hill, 250 feet high, at the portage between lakes No. 10 and No. 11, over thirty of these small lakes were counted, filling the valleys on all sides.

Forest fires.

The greater part of the region is destitute of forest trees, these having been removed by frequent extensive fires. The bare rocks of the hills are thickly strewn with boulders, often of great size, while the valleys are filled with the same, often to a depth of many feet, and without sufficient sand or clay to conceal the space between them. Usually a thin covering of vegetable mould is found on the heaps of boulders. In a few places on the lakes, sandy shores are seen, but the greater part of the shores and islands are formed of solid rock or of heaped up boulders.

Small trees.

The unburnt forest is made up of small trees never more than thirty feet high nor exceeding ten inches in diameter. Black spruce is the most common, and on the lower ground grows thickly together, while on the hillsides it is only found in open glades. Larch occurs in the swamps, and there grows to a larger size than any of the other trees. In abundance, Banksian pine ranks next to the black spruce, but is generally small. A few small trees of white birch are seen in clumps on the higher ground surrounding the lakes, and are accompanied by an occasional clump of struggling aspen never over four inches in diameter.

High ridges.

From the top of a hill rising 350 feet on the north-west side of Clearwater Lake, an uninterrupted view of the surrounding country was obtained. To the southward, the high hills of the ridges already passed are seen extending north-east and south-west. To the eastward, they appear to have about the same altitude as those seen along the route, but to the westward they are considerably higher, and some of them, ten or fifteen miles to the south-west of the lake, must rise from 500 to 800 feet above the general level. Their tops are bare, and large

patches of snow were observed on their northern sides on July 14th. Northward, the country is not so broken, and none of the ridges rise above 300 feet, while the valleys are broader, with more swampy land and fewer lakes. Farther away in this direction, there is another range of higher hills extending east-and-west beyond the East Main River.

The country surrounding the discharge of Clearwater Lake is at first Flat country, rolling, but after passing the small lakes it becomes flat, and the river winds through an extensive swamp, with only a few isolated rocky hills rising from it. The swampy lands are thickly covered with small black spruce, larch and Banksian pine, the trees increasing in size as the East Main River is approached. Boulders are less numerous, and there is a considerable amount of fine yellow sand arranged by the river in small terraces along its banks and about the small lakes.

On an island in Clearwater Lake the soil was found to be frozen solid, at a depth varying from six to nine inches below the surface.

East Main River.

The Hudson's Bay post at the mouth of the East Main River, on the east shore of James Bay, has been determined by W. Ogilvie, D.L.S., in 1890, to be in latitude $52^{\circ} 14' 45''$ N. and longitude $78^{\circ} 29' 15''$ W. Position of the mouth.

The river, at its mouth, is a mile and a half wide, but is obstructed by a number of sand and shingle shoals, bare at low water, with shallow channels between them. The river-banks are low and sandy. As the river is ascended, the sand gives place to clay, cut in places by the river into steep faces. The Hudson's Bay Company's post is situated on the south side, three miles from the mouth, where the banks are about fifteen feet high. The river opposite the post is a little under a mile wide. Three large islands of clay occupy the southern side of the river for two miles and a half above the post, with a narrow, shallow channel between them and the mainland on that side. Opposite the head of the upper island a small river, called Fishing River, falls into the main stream from the north-east. Tide-water extends seventeen miles up the river, and for this distance the course is about due east. The banks are low, formed of stiff blue clay, and much of the land on either side is low and swampy. The river gradually narrows from a width of three-quarters of a mile, above the islands, to about a quarter of a mile at the head of tide, where a small stream, called Coldwater River, comes in from the south. The current, from the mouth to the Hudson's Bay Company.
Head of tide.

head of tide, varies from two to four miles per hour. Along the river-bottom there is an abundant growth of medium-sized white and black spruce, balsam fir, aspen and balsam poplar.

Immediately above the head of tide, the character of the river changes to a succession of rapids, and for the next six miles the banks become increasingly higher, with steep cut faces, showing clay overlain by sand, or sometimes coarse boulder-clay, with an occasional exposure of rock coming up from beneath. The banks here rise from fifty to one hundred feet. The valley becomes gradually narrower and the rapids heavier, until in the upper mile and a half the river is only about 100 yards wide and falls seventy-five feet through a shallow, rocky gorge, called Basil Gorge. The general course of this stretch is N. 75° E. Immediately above these rapids the river again changes to a quiet-flowing stream about 600 yards wide, with low banks and a flat country on either side.

Two miles above the head of the gorge and twenty-five miles from its mouth, the river divides into two branches, which appear to be nearly equal in size, one coming from the north-east, the other from the east, the latter being the one surveyed. From the Indians at East Main post, it was learned that the north-east branch is called the Opinaea or Straight River, and that its volume is about two-thirds that of the other branch. It is much the easier river to ascend, being free from long rapids and portages, and takes its rise in a number of large lakes between the head-waters of the East Branch and those of the Big River.

Above the forks the course of the east branch is due east for seven miles, while its width varies from 600 to 800 yards; the current is sluggish and the banks low, but they rise gradually as the stream is ascended, so that in the last mile and a half of this course, they are from fifty to seventy-five feet above it, and present cut faces of stratified sands and clays, or of boulder-clay. The river here narrows to a width of 300 yards and becomes rapid.

At the end of this course there is a sharp bend to the south, and a quarter of a mile above the bend is a chute of twenty feet called Talking Falls, with strong rapids below and above it. From this chute, the river, with several minor bends, has a general south-east course for the next six miles, being almost a continuous rapid, with about 120 feet fall, including a chute of sixty-five feet, called the Island Falls, at the upper end. At this chute the river is divided into a number of narrow channels by several small rocky islands. The banks along this portion of the river are not high, and the country appears to rise with

the river. There is a portage of 400 yards on the south side past the chute, and two miles above it a small river, called the Miskimatao, comes in from the south.

Above the chute, the river again expands to an average width of 600 yards, and flows from N. 60° E., almost on a level with the surrounding country, for ten miles between low banks of clay capped with sand. The timber continues the same as before, but is somewhat smaller. The river now narrows to 250 yards, and continues with small rapids northward for a mile, between rocky hills, then turning east, it widens slightly and is less rapid for another mile, to the foot of a narrow rocky channel called Clouston Gorge. This gorge for a mile and a half from its mouth is perfectly straight, and is never more than 100 feet wide, narrowing in one place to thirty feet, with rocky sides that rise almost perpendicularly 100 or 200 feet above the river, which rushes through it in one great rapid, falling in the interval 105 feet.

Clouston
Gorge.

Above this the course changes to S. 70° W., and the river becoming slightly wider, mounts in the next three-quarters of a mile twenty feet to the foot of a rocky island 1200 yards long with a narrow channel on either side. Through these channels the river falls over 100 feet in a succession of chutes. For three-quarters of a mile above the head of the island, there are a number of small islands with rapids between them.

To pass these obstructions it is necessary to portage canoes and outfit three-quarters of a mile through a deep swamp, with only one spot sufficiently dry to allow the loads to be laid down. The portage begins immediately below the gorge on the south side, and ends in a small bay near the head of the islands.

Bad portage.

The river is now found flowing nearly at the level of the surrounding country, with a sluggish current between low banks that become more and more sandy. The general course of the next stretch is N. 60° E., and the distance twenty-two miles, the breadth of the river varying from a quarter to three-quarters of a mile, with an average of about half a mile. The limit of balsam poplar is reached near the upper end of this course, a fact due probably to the absence of low clay banks, along the river above. The other trees are smaller, and white spruce beyond this becomes scarce. White birch is now a common tree, and Banksian pine is found wherever second-growth timber occurs on sandy soil.

Limit of
balsam
poplar.

Continuing on the same course for three miles and a half, the river again becomes rapid, and flows in a valley which at first is about 200 yards wide, with scarped sandy banks which rise about 150 feet above

Conglomerate Gorge. it. Soon the channel narrows to less than 100 yards, and the sandy banks give place to rock as it enters Conglomerate Gorge. In the upper half of the distance the fall is very steep, the river passing with a succession of chutes, in small channels between a number of small, narrow, rocky islands. The total fall here is over 100 feet, including three chutes of twenty, ten and thirty feet respectively.

Character of the lower river. From the head of this rapid, the river bends to the south for a mile, then S. 30° W. one mile, and again south another mile to a chute of ten feet. At this last fall, the character of the river and surrounding country changes. From its mouth to this point the river has flowed in a shallow valley, nearly on the surface of a number of broad terraces of stratified sand and clay, arranged one above the other. Where it descends from one level to the next, the river has cut a valley back into the sands and clays of the upper terrace until the underlying rock has been reached, over which it falls in a succession of rapids and chutes, often hemmed in by steep rocky walls.

Marine terraces. The terraces are composed of marine deposits laid down during the depression of the land at the close of the glacial period, when the level of the western side of the Labrador Peninsula was over 600 feet lower than at present. Farther up the river, marine deposits are wanting, and the surface material is formed of unstratified, coarse boulder clay. Owing to the absence of terraces, there are no marked drops from level to level, but rather a more or less gradual slope of the whole country, while the river, without even a shallow valley as in its lower part, flows almost at the level of the country and follows the general slope, except where diverted by rocky ridges that cross its course obliquely in several places. In the lower part the river is obstructed only by islands at the various falls, and there are few rock-exposures elsewhere; while in the upper part rocky islands are everywhere numerous, and long stretches of the shores are also formed of rock.

Country surrounding the lower river. The surrounding country, in the lower part, is generally flat and often swampy, but there is a marked absence of small lakes though about the upper part of the river some are found in every valley between the low, rounded, rocky hills that characterize this region. The soil in the hilly country is scant and poor, being composed wholly of boulder-clay, often with very little finer material. The climate also appears to be more rigorous than it is nearer the sea-coast, and the timber is much smaller, consisting of the following species arranged in order of abundance:—Black spruce, Banksian pine, larch, balsam fir, white birch and a few stunted aspens. The larch grows to the largest size, a few trees being upwards of twelve inches in diameter near the base; the other species seldom or never have a diameter

Timber.

exceeding nine inches, and in the upper part of the river are only found growing thickly on the lower ground, about streams or lakes, with the hills only partly covered by small trees of black spruce and Banksian pine. The white spruce does not grow beyond the limits of the deposits of marine sands along the East Main River.

Above the last-mentioned chute, the next course is about due east, including two short sharp bends to the south, in a distance of eight miles. Along this course, the river flows in a shallow, rocky channel, about a quarter of a mile wide, through an almost flat region, broken only by a few low, rounded hills. The descent is sharp, there being five rapids and two chutes of six and eight feet, separated by short intervals of swift current. At the upper rapid and chute, the river bends to the south-east, for another eight miles. In this interval it is broken into several channels by a number of large low islands, strung out along the entire distance. The current in these channels is moderate, with only one small rapid near the upper end. The Kausabiskau River is a small stream, that falls in on the south side near the foot of this rapid.

Character of
river above
Conglomerate
Gorge.

Further up, the river for twenty-five miles, forms a long gentle curve, bending first slightly north and then south of east, so that a line joining the ends of the curve would run east-and-west. Here, stretches of quiet water connect five short heavy rapids. Rocky islands are numerous and the shores are low and in places rocky, but more commonly swampy. To the south, there are hills running in ridges roughly parallel to the course of the river. These culminate four miles up this course, in Flat-topped Mountain, that rises nearly 500 feet above the water-level. The rest of the range rarely exceeds 300 feet, and 250 feet may be taken as its mean height above the general level. Similar ridges of rounded hills are seen to the northward, but they do not appear to be as high as those on the other side and they are more distant, leaving a wide margin of low swampy land between their bases and the river. The trees on these hills have almost all been burnt recently, leaving only a few patches of green wood. Where the rapids occur in the river, the hills close in on either side.

Swamps.

Medium sized rivers fall into the main stream at the second, sixth and tenth mile of this course. The first and third are called respectively, Wabistan and Akuatago, both coming from the southward; the second is called the Wabamisk, and comes from the northward. It is much larger than the others, being about 200 feet wide, at its mouth, with a slow current.

Wabistan and
Akuatago
rivers.

The main river above bends to the south-east for eight miles, and then to the east again for eight miles. The country and river have much

the same character as the part last described; the current being somewhat stronger, with three small rapids. At the upper end of the last course, there is a small stream, called the Clearwater River, that comes in on the north side, and flows in a wide straight valley from E. N. E., a continuation of the valley in which the main river flows below. The Indians who hunt in this region, say that it is only a half day's journey from the mouth of this stream to a large lake on a branch of the Straight River.

The Great Bend.

Turning now sharply to the south-west, the main river, which has had an average breadth of over a quarter of a mile, enters the Great Bend, and contracts to about 100 yards, and for the next fifteen miles is nothing but a succession of heavy rapids and chutes. Its banks are high and rocky in most places as it breaks the range of hills before mentioned on the south side. The surrounding country is much rougher than any before seen, with rounded hills, from 200 to 300 feet high, arranged in close parallel ridges. The lower six miles of the river are particularly rough, and as the perpendicular cliffs on both sides render portaging impossible in many places, it is with difficulty that this part of the river is passed with canoes. At one place about three miles from the foot of the rapids, there is a sharp bend to the northward, and the water rushing down is deflected by a sharp point running out from the east side at the bend, which causes the greater volume of the water to enter a small bay, where a great whirlpool is formed. It is stated that many years ago two large canoes belonging to the Hudson's Bay Company were drawn into this whirlpool and all on board drowned.

Broken country.

Whirlpool.

At the upper end of this south-west course, a small stream, called Misatawagamisistic River, comes in from the south-west, and it is believed that there is a portage-route by it, past the rapids below.

Turning now to S. 40° E. for three miles, the river gradually widens, and passing two small rapids, again becomes easily navigable. It flows, with a sluggish current, in a channel 500 yards wide, and only slightly below the level of the surrounding low, flat, swampy country. This continues for fifteen miles, the general course being N. 60° E. Two small rivers come in along this course from the north. At the upper end there is a fall of ten feet, above which the river, continuing along the same course for fourteen miles, has a similar sluggish current, with the exception of one small rapid at the head of two large islands. The surrounding country remains low and swampy, except in the vicinity of the rapid, where a low range of hills passes close to the river on the south side.

Country above the Great Bend.

Above the two islands, the river again turns to the east, and flows with a remarkably straight course for nineteen miles. The hills on either side here close in and narrow the valley, through which the river runs at a uniform rate of about four miles per hour, in a shallow channel averaging 400 yards in width. The hills, as a rule, do not rise much above 200 feet from the water, and only an exceptional one reaches 300 feet. They are arranged in ridges nearly parallel to the course of the river.

Along the upper three miles of this course, the channel narrows to about 150 yards, and the current increases where a descent is made through a narrow cut in the hills. There is now a sharp bend to the south and then to the south-west for a mile and a half, as the river cuts through a range of hills, with a fall of twenty-five feet, including a chute of fifteen feet. At the bend, a small river comes in from the north-east.

The surface material covering the hills along the last two courses is generally thin, and is in places composed largely of boulders, often of large size, with the spaces between them only partly filled with finer material.

The forest, for the most part, is made up of small second-growth black spruce, Banksian pine, larch, balsam fir and white birch, with a few aspen poplar.

Above the bend, the river again enters another valley between parallel ridges. Its courses are: first, east five miles, then N. 60° E. four miles, and again east eight miles. The average width is again about 400 yards, with a swift uniform current and only one small rapid. As this portion is ascended, the country becomes rougher, and the hills rise with steep slopes, from 200 to 400 feet above the water. The greater part of this region has been recently burnt, only patches of blackened soil being left to partly cover the rocky hills, while innumerable boulders are seen scattered everywhere over the surface. A river about three chains wide at its mouth comes in from the south at the end of the first course.

Another sharp bend of three and a half miles to the west of south now follows, and in the lower mile and a half the river passes through a narrow rocky channel with perpendicular sides, called Prosper Gorge, and falls in a succession of chutes and rapids over one hundred feet. To avoid this obstruction, the river was left four miles and a half below the bend, by a portage of three-quarters of a mile, which passes over a ridge and ends about the middle of the west side of a lake three miles long and three-quarters of a mile wide. This lake discharges from its

north-east end by a small stream, nearly a mile long, into a second lake one mile long by half a mile wide. Crossing this lake, the small crooked stream by which it discharges, is followed some two miles to where it falls into the main river, two miles above the bend, and thus above the chutes and rapids. There is only a slight fall from the upper lake to the river, and as a consequence, when there is a freshet in the main stream, the water from it backs up into the lakes instead of discharging from them.

Above this portage the river becomes very crooked. It first flows from the east for a mile and a half, then from south-east one mile, N. 80° E. three miles, S. 30° E. three-quarters of a mile, S. 45° W. a mile and a half, and finally S. 45° E. six miles, where it leaves an expansion over one mile wide, and full of large islands, at the foot of the Ross Gorge, running south.

Ross Gorge.

Through this gorge the river falls sixty feet in two miles. The portage past it starts from a small bay on the west side, and is divided into two parts by a small pond. The first part is 300 yards long and rises about 150 feet; the second is three-quarters of a mile in length, passing over a steep ridge of boulders and ending in a small stream which enters the river a short distance above the head of the chutes.

About half a mile below the upper end of the portage, a river falls in on the north side. It flows in a deep, rocky valley running east-north-east for several miles, and has a long heavy rapid above its mouth. Its size has been estimated at about one half that of the main branch, and it has been called Ross River. Above the gorge the main river is split into a number of small channels by several low islands. These islands form a delta in the eastern end of Lake Nasas-kunaso, which extends to the westward six miles, and is a mile and a half across in its widest part. The river passes only through the east end of the lake, which formerly must have extended to the head of the portage, the portion now occupied by the delta having been filled up with alluvium brought down by the river. Surrounding the lake are rocky hills that rise from 200 to 400 feet above its surface. The greater part of the adjacent country has been burnt over recently.

Lake Nasas-kunaso.

Hudson's Bay Company's canoe route

From its west end, the canoe route of the Hudson's Bay Company leaves the East Main River to cross to the Rupert River on the way from Nicheun to Rupert House. This lake is considered by the employees of the company to be situated half way between these two places. The Indians who hunt in this region are in the habit of congregating here and on the lakes at the foot of the large island above, to meet the canoes going to and returning from Rupert House.

Above Lake Nasaskuaso the character of the river and country again changes, the latter becomes flatter and less rugged, the hills seldom rise over 150 feet above the river, and the ridges are farther apart, with swamps and small lakes filling the broad shallow valleys between them. The river flows almost on the surface, and is often divided into several channels by large islands. Small lakes and bays also branch off on either side, so that it is difficult to tell when a tributary river falls in.

Character of
country above
Lake Nasas-
kuaso.

In this manner the river continues for nine miles, when it becomes divided into two main channels by Grand Island, fourteen miles long and five broad. The north channel is more than twice the size of the south one, and it is further sub-divided, especially in its lower part, by large islands. The south branch, from the foot of the island, passes southward about five miles and widens out into two lake-expansions with numerous bays, all having an east-and-west direction. Into the south-west bay of the upper lake, five miles from its outlet the Clearwater River enters. This is a small stream flowing out of a large lake of the same name on the portage-route from Lake Mistassini.

Grand Island.

The upper lake referred to has been called Tide Lake, on account of the deposits of mud that cover the shores and islands up to freshet mark of the river, giving the lake the appearance of a tidal bay at low water.

For seven and a half miles above the head of Grand Island, the river averages 500 yards in width, but is shallow and much obstructed by sandy shoals. Its direction is again eastward at the head of this course is the junction of the Tichegami River. This stream takes its rise, according to the Indians, to the south-east, near the head-waters of the rivers flowing into the north end of Lake Mistassini. In volume, it appears to be about two-thirds that of the main branch, and it has a heavy rapid at its mouth.

Tichegami
River.

There are only a few families of Indians who hunt along the lower part of the East Main River, there being a long interval from Lake Nasaskuaso to below the Great Bend, that is totally uninhabited. Owing to the numerous rapids and chutes, this river above the mouth of the Straight River, is not used as a highway to the interior, and only one family ascends it above that stream. Previous to 1889, there were three families who hunted in the neighbourhood of the Wabamisk River, but during that winter, with the exception of one woman and a small boy, these all perished by starvation or cannibalism. In 1892, the scene of this tragedy was found at the mouth of that river, but, nothing being known of such an occurrence, it was only remarked as

Indians of the
East Main
River.

Famine.

unusual that Indians should leave their tents standing, and their household effects scattered about.

Increase of
fur-bearing
animals.

Above Lake Nasaskuaso, from the many old camps seen along the river, there must be a number of families who hunt in this vicinity, and who in the summer descend to Rupert House, by the portage-route to the Rupert River. Owing to the absence of hunters along the greater part of the river, the fur-bearing animals are rapidly increasing, and beaver signs are quite common; bear tracks are also numerous in the burnt regions. Not a sign of caribou was observed from Lake St. John to James Bay, and these animals seem to have been totally exterminated in the region about Lake Mistassini and from there westward to James Bay, being now only met with to the north and north-east of the East Main River.

Fish.

Fish are found in abundance in every lake and river, throughout the region. The following kinds were taken in the net along the East Main River:—Whitefish, pike, pickerel and suckers. In the lower parts, where the banks and bottom are formed of clay, sturgeon are taken in abundance by the Indians; and from the mouth to the first fall, and in the tributary streams, small whitefish and sea-trout ascend from the sea in large numbers, from about September 1st, until the river is closed by ice. Trout are also caught in the rapids of the upper part of the river.

Upper East Main River.

Kowatstakau
River.

Three miles above the Tichegami, a rocky ledge crosses the river diagonally, causing a low fall, where the survey of the lower part of the river in 1892 began. Above this fall the river bends sharply northward for a half mile, and then about south-east for three miles, to the head of a long, but not strong rapid, which occupies the upper half of that distance. The direction now changes to north-north-east for two miles and a half to the mouth of the Kowatstakau River, a large branch coming in from the northward and entering the river from a considerably higher level by a heavy rapid or low chute. According to Indian estimation this stream carries about one-sixth of the water of the main river. Immediately above the forks, what appears to be another branch, also broken by rapids, is seen on the south side; but it is only a channel passing on the south side of a large island or islands, and separating from the main channel above the rapids and portage, five miles farther up. The north or main channel contracts from a width of nearly half a mile, below the island, to less than a quarter of a mile, and the current is quite strong, with two rapids, the lower of which

two miles above the foot of the island, is a half mile long; but the upper one is short and steep, with a tremendous rush of water, the river falling eight feet in one hundred yards. The portage is on the north side, and is called the Sunday Portage.

Up to this portage the country surrounding the river is low and almost flat, with only a few isolated hills that seldom or never exceed one hundred feet in elevation above the general level, while the river flows only slightly below it, in a shallow valley from 300 to 1000 yards wide, having in most cases low sandy banks never more than seventy feet high. The sand and gravel of the banks are made up of modified boulder-clay arranged by the action of the river. On either side of the river, the soil appears to be light and sandy, and, as small fires only have traversed this region, the timber has not been destroyed, but thickly covers the country, the trees occurring in the following order of abundance:—black spruce, *Balsam* pine, larch, balsam fir, white birch and aspen, the last being exceedingly rare and only found along the river in low straggling clumps.

Character of
surrounding
country.

Above Sunday Portage the river flows directly from east for the next four and a half miles. The average width is nearly 400 yards and the current is strong, with two rapids one and two miles above the portage, the upper one being so heavy that canoes must be lightened to ascend it. The portage past it is about 200 yards long, on the north side. At the foot of the lower rapid a small branch from the south joins the river.

The river now turns sharply to the northward, and, flowing from that direction, in the next mile breaks through a low ridge in a shallow, narrow, rocky channel, and falls fifty-five feet from the level above, the descent taking the form of a heavy rapid. To pass this the Pond Portage is made on the east side. To reach it a small stream is ascended about 200 yards, and from there 200 yards portage up a low hill leads to a small pond; crossing this, a rough road over boulders and through swamps for half a mile ends at a small channel of the river, behind an island. From here the course is N. 45° E. for a mile, and then in a general direction N. 45° W. for five miles, with many minor bends and crooks. About one mile up this course, what appears to be a large branch comes in on the east side, but it is probably only a channel leaving the main stream several miles above, and so forming a large island. The river continues about a quarter of a mile wide, is shallow, and flows with a strong steady current, breaking into small rapids at points and narrows. Another small stream comes in from the northward at the upper end of the course. Now again bending

Pond Portage.

eastward a mile above, the river widens out into a small lake, so crowded with low islands that its limits cannot be seen.

Character of
country above
Sunday Port-
age.

From Sunday Portage to this lake, the character of the river banks and surrounding country is similar to that before described, the banks being low and the country nearly flat, with isolated hills and rocky ridges generally under 100 feet, and never exceeding 250 feet in elevation.

Height above
sea-level.

Owing to an unfortunate accident on the Koksoak River, through the upsetting of one of the canoes, the barometer readings were lost, and only a few booked in the survey note-book remain. From the mean of these data the height of the river in this vicinity is roughly found to be 1400 feet above sea-level, which agrees closely with the supposed difference of level between here and Lake Mistassini, that place being fixed from the mean of readings taken from two aneroid barometers and extending over several months.

Hills.

From the lake-expansion, the river bends southward for a mile, and then directly east, flowing from that direction four miles, from the base of a high rocky hill on the north side, which forms a part of a range extending from beyond the north side of the lake to the eastward. These hills are very steep and rocky, being formed of the hornblende-granite that now takes the place of the softer schists and gneisses of the flat country below. They rise from 400 to 500 feet above the river.

Trees.

Before reaching the foot of the hills, the river becomes somewhat wider and flows between low banks of sand and gravel with a moderate current in a shallow channel, much obstructed with low sandy shoals. Much of the surrounding country has been burnt over, and in part is covered with small second-growth trees, Banksian pine then predominating. Where unburnt, the forest is somewhat larger and thicker than that seen lower down; this is owing most likely to a better soil.

Lower coun-
try about
Sharp-rock
Portage.

At the foot of the hill the river again abruptly bends to the south for a mile and then gradually turns and resumes its easterly course for five miles to Sharp-rock Portage. Up to here the character of the river is similar to that lower down, being flat and shoal with a moderate current broken by two short rapids, the lower on the bend and the upper two miles above it. The range of hills on the north side continues along the river and crosses it at the portage, but so much lower that at the crossing it is little over a hundred feet high. To the southward the country is almost flat and both sides have been almost totally burnt over, the fire on the north side being most recent.

Sharp-rock Portage is on the north side and is about 400 yards long, the lower half passing over sharp vertical bands of hornblende-schist. The river falls ten feet over the same ledges.

Above the portage, the course is N. 60° E. for three miles to another portage, 200 yards long, where a chute of eight feet occurs. Between the portages the banks are low, with traces of a terrace twenty feet high on the south side.

Farther up, the river flows from the north for a mile, and then from the east four miles to where it passes out from between rocky hills, from 200 to 300 feet high. From the last portage to this point, the flat valley is somewhat wider, and the shallow channel of the river is obstructed by a number of islands and gravel shoals, the current here being very strong. Wide valley
above Sharp-
rock Portage.

After the hills are entered, the course is south-east for two miles, and then north for two miles. Along the south-east course the river is less than 300 yards wide, but on the northern course the width is irregular, varying from 300 to 800 yards. The current everywhere is strong.

At the bend, a medium-sized stream comes in from the south, Mink Chute, and perhaps another on the north side a mile below. Another bend to the eastward, and a mile of river, leads to Mink Chute, thirteen feet high, passed by a short portage over the rock on the east side.

The country surrounding the river from Sharp-rock Portage to here, is rougher than that seen below. The ridges of rocky hills are closer together and slightly higher, and there are also ridges of till apparently arranged roughly parallel to the direction of the glacial striae, or S. 70° W. On both sides of the river there have been extensive fires and little of the original forest remains. The trees continue similar in size and numbers to those described below, aspen being the only one now absent. Terraces of sand and gravel are seen on both sides up to thirty feet above the water, and occasional cut-banks of boulder-clay are noticed, where the river has eaten away parts of the low hills of drift mentioned above. The rocky hills are moderately strewn with boulders. Character of
country above
Sharp-rock
Portage.

Mink Portage is followed closely by another short one, on the south side, past a chute of nine feet; and then for five miles the river flows rapidly between low and rocky banks to Channel Portage. This portage is on the north side, and is about 800 yards long, terminating in a small channel above a fall and behind several rocky islands. Up to the head of the islands there is but one small rapid in the next mile, whereas the main or south channel is a succession of chutes and heavy rapids for nearly two miles. Channel
Portage

From the head of the islands, the river widens to over half a mile and flows evenly from the north-east between low sandy banks, over which can be seen high hills in the distance to the north-east, east, and south-east.

Four miles of quiet water is followed by a shallow, flat rapid, full of small rocky islands and large boulders. After a sharp bend the course is to the north for a mile, and then north-east for two miles to another small lake-expansion. Along the two last stretches, the river, contracted to less than 300 yards, flows between rocky banks, and is greatly obstructed by rocky islands and ledges, which cause short heavy rapids with very swift water between them.

Character of
country above
Channel
Portage.

On the south side, at the head of the rapids, a conical hill rises 350 feet above the river. From its top a good, unobstructed view of the surrounding country may be obtained, as it is totally burnt over and bare. To the north-east, the river is seen flowing with but one bend, through a wide, straight valley, surrounded by low hills. Those on the north side are about 200 feet high, and are arranged in close, compact ridges, everywhere well wooded. On the south side, there is a wide valley filled with small lakes, that separates the conical hill from a higher range parallel to, and forming the north wall of the river-valley. The highest of these hills reach and may exceed 500 feet. They are bare and rocky, and have a very barren, desolate appearance, due to the absence of green woods; fire rather than unfavourable climatic conditions being the cause, as some of the hills have small patches of unburnt trees upon their summits. The sides and tops of these bare hills are strewn with innumerable boulders of all sizes, from masses several tons in weight to small gravel, but there is not much of the finer material on the upper parts.

Timber.

In the river-valley, larch is seen eighteen inches in diameter, and black spruce and balsam fir of twelve inches, are common. The only evidence of an approach to barren ground, is afforded by the thinning out of *Ledum* and *Kalmia* and the substitution of white reindeer moss as undergrowth, while the trees begin to grow wider apart with frequent open glades.

Abundance of
till in this
region.

Above here the character of the river changes somewhat, long islands of till are numerous, and there is a marked absence of terraces or stratified deposits, these being replaced by banks of irregular height and outline, formed by the river cutting through the low lenticular hills of moderately fine boulder-clay. The islands formed of similar materials, appear to be hills of the same description, and have only been separated from those on either shore by shallow channels cut between them. For three miles and a half the river is over half a mile

wide, but is very shallow, and its bottom is thickly strewn with boulders and subangular blocks of gneiss and granite, very similar to the rock-masses seen in place in the vicinity. The descent, both here and in the expansions further up stream, is constant and quite steep, causing the water to flow with a very swift smooth current, which is more difficult to ascend in canoes than broken water, where the eddies and quiet places behind boulders and other obstructions are available to rest before the canoe men attempt other short ascents; whereas in the steady, strong, smooth current no such chances to rest occur, and every foot gained must be held.

Bending from east to north-east, the river contracts to about 300 yards for two miles, and again expands at the head of a large island, at the end of the course. Two small streams enter from the north, at the upper and lower ends of the stretch.

Turning eastward again, the banks become more rocky and irregular, with numerous small bays, so that the breadth of the stream varies from 300 to 1200 feet. There is a small rapid on a mile and a half up, and at its head a large stream named the Misask River enters on the north side. From this place the general course is N. 50° E. for six miles, to the Cascade Portage.

Misask River.

Immediately above the Misask River, the main stream is divided into two equal channels by a large island. The north channel is followed east for two miles and then south for three-quarters of a mile to the head of the island. The whole distance is a continuous rapid, culminating on the south bend in a chute of fifteen feet, which is passed by a portage of 800 yards on the east side. There is a steep rise of one hundred feet at the lower end of this portage, from the river up a cut-bank of till, to the level of the ridge above. From the head of the island, half a mile of quiet water leads to another portage, on the west side, 1000 yards long, past heavy rapids, followed by small rapids for half a mile, to the foot of another large island. Following the smaller and southern channel, another half mile of stiff current leads to the Meat Portage, 300 yards long, on the west side. Another short rapid is then passed, to the head of the island. The rise in the river has now brought it to a level with that of the surrounding country, which is broken only by low ridges of till and an occasional rocky hill, seldom exceeding one hundred feet, so that the surface presents the appearance of a very rolling prairie, especially to the southward, where most of the trees have been burnt. Everywhere the surface is covered with innumerable boulders and subangular blocks of granite and gneiss.

Heavy rapid
to Meat
Portage.



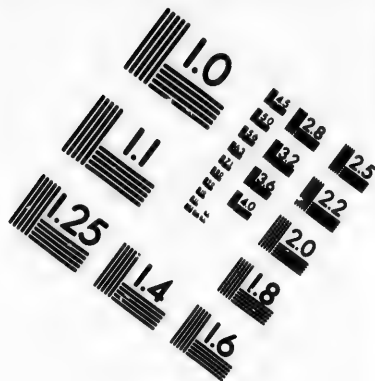
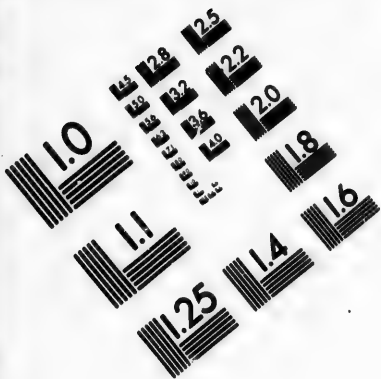
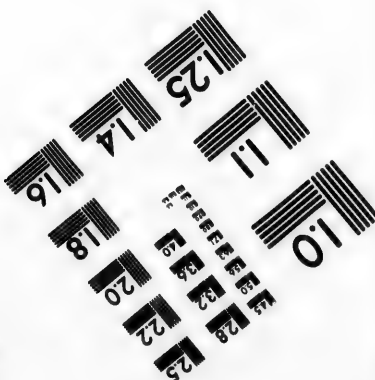
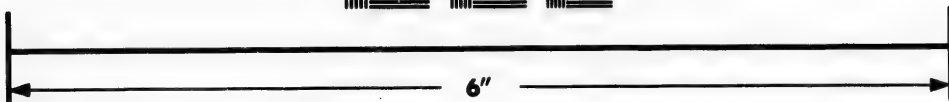
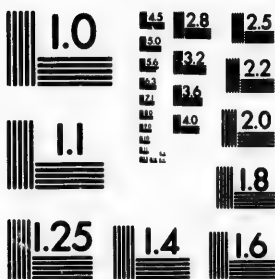


IMAGE EVALUATION TEST TARGET (MT-3)



**Photographic
Sciences
Corporation**

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

24
28
32
36
40
44
48
52
56
60
64
68
72
76
80
84
88
92
96
100

10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100

Character of
the river below
Long Portage
Creek.

Having now reached the general level, the character of the river changes, and for the next nine miles, to Long Portage Creek, it is a succession of lake-expansions, connected by short rapids. These expansions are broken by deep bays, running between the low ridges, and often pass by small narrows into other lakes, the country being now covered by a perfect network of small lakes and watercourses, lying between the low hills. The general course is slightly south of east. The first lake is about one mile and a half wide, and it is two miles from the head of the island to the next narrows and rapid. The water is shallow and there are several large islands. The rapid above is half a mile long and is followed by a smaller lake, one mile long, to a very heavy rapid, passed by a portage of 900 yards on the south side. Above, there is quiet water for half a mile, and then rapids, half a mile long, are followed by swift current for two miles to the next lake-expansion. This lake is also full of large islands, and a narrow channel on the north side leads into a chain of lakes extending over ten miles to the north-east and branching off into numerous other small lakes on either side of the main chain. A mile and a half of steady current leads to another small lake, into which the Long Portage Creek flows.

River above
Long Portage
Creek.

Here the main river takes an abrupt bend to the south-west, and after a short sharp rapid is ascended is found to widen out into a string of lakes with numerous deep bays, for about fifteen miles; it then breaks into a heavy rapid two miles long, above which it continues south-west for a considerable distance, when it again turns eastward, passing behind a high hill some fifteen miles south of the forks.

Character of
country above
Long Portage
Creek.

The country about the forks is very similar to that already described, consisting of a series of low ridges of boulder-clay, arranged in broken roughly parallel lines, coinciding with the direction of the glacial striæ, or S. 70° W. The general height of the ridges is about fifty feet, while the highest rarely exceed one hundred feet. Between and parallel with them are innumerable small shallow lakes, irregular in shape and full of high islands formed of mounds of till. These lakes are joined together by small watercourses, following each valley, and the different chains often have lateral connections where an interval occurs between overlapping ridges. The only conspicuous landmark in this vicinity is the rocky hill situated about fifteen miles south of the forks; it rises about 500 feet above the general level, and is unconnected with any other high land. To the south, south-east, east and north-east the horizon is bounded by chains of high hills, at a distance ranging from twenty to fifty miles from the forks.

The East Main River was explored only as far as the head of the two-mile rapid mentioned above. The route to Nichicun leaves the main stream at Long Portage Creek, where the river is still a large stream, being nearly 200 yards wide at the rapid there, with an average depth of three feet. According to information received from the people at Nichicun, the main stream, although large where the route leaves it, soon splits up into numerous branches, none of which are of any considerable volume or length. The river bends to the south-west for some twenty miles, and then turns eastward again along the northern foot of the mountains that here form the watershed between the Rupert, East Main and Big rivers, flowing into Hudson Bay, and the Peribonka and Outardes rivers, emptying into the St. Lawrence.

Upper East
Main River.

Misawau or Long Portage Creek, from its mouth to the portage, following the stream, is thirty-three miles long; but in a straight line the distance is twenty-four miles, and the general course is slightly north of east; the difference in length being due to its crooks and turns. From the East Main River, for the first six miles the course is north-east, the stream here consisting of a number of small irregular lakes, joined by short stretches of river. At these narrows the river is generally about one hundred feet wide, with a moderate current and deep water. This course terminates with a rapid of six feet fall, passed by a portage of 400 yards on the north side.

Long Portage
Creek.

For the next four miles the river flows from the east, with a uniform breadth of one hundred feet. The current here is strong, with three short rapids, the upper passed by a *demi-charge*. Next follow small lake expansions and swamps for four miles, in the same direction, with one short rapid near the upper end. Still further up, the river is crooked, and forms a reversed curve, ending at the forks, four miles beyond, where it splits into two equal branches, the route following the eastern one.

Above the forks, the average breadth continues to be about one hundred feet, and where small rapids or swift current occur the water is so shallow that wading is resorted to in order to pass loaded canoes. For nine miles from the forks, to the Rocky Portage, the character of the river is constant; it has in most places a sluggish current, with small shallow rapids at long intervals. The banks are low, and the immediate surrounding country swampy. The portage is 500 yards long, and follows the side of a hill on the south shore. The river here passes through a narrow valley, between high rocky hills, and in so doing falls thirty feet. The valley widens above the portage, and the river again flows from the east, in a low valley,

Rocky
Portage.

filled with numerous small lakes on both sides, connected with the river. As the Long Portage is approached, the river becomes more rapid and shallow, and it is only with great difficulty that loaded canoes can be taken up it. It is left at the Long Portage, where it turns to the northward, rising in the small lakes in that direction, at no great distance above this place.

Character of
country about
Long Portage
Creek.

The country surrounding the lower part of this stream is almost flat, and is traversed by ridges of till never more than fifty feet high. These gradually rise until the forks are reached, where they average 100 feet. From the forks to the Rocky Portage the hills recede, leaving a low swampy valley through which the river flows sluggishly in a channel but little below the general level. At this portage the first rock seen in place along the river occurs. The stream here falls over ledges of red granite as it passes down a narrow valley between two steep rocky hills that rise abruptly to 300 feet.

From here to the Long Portage the valley is again wide and strewn with numerous small lakes and swamps, connected by short channels with the main stream. The hills on either side now have an average elevation of 300 feet, and often show rocky faces.

Over one half of the country surrounding the river has been burnt, and is now covered only with low shrub and reindeer moss. Owing to the want of forest growth, the innumerable boulders and angular blocks of all sizes stand out in remarkable distinctness, giving to the hills the appearance of gigantic plum puddings. These blocks and boulders with the amount of drift are a feature of the country, the drift along the lower parts of the stream being so thick that it covers all the underlying rocks which can be determined only from the profusion of angular, untravelling blocks scattered about. On the very summit of the high granite hill on the north side of the river, at the Rocky Portage, there is a perched boulder over ten feet cube. Its corners are only partly rounded. Numerous other large boulders are scattered over the highest parts of this hill, and so thickly are they everywhere strewn that one might walk for miles over the country in almost any direction without touching the soil with the foot. The trees along the river are small and somewhat scattered, with little underbrush, the ground being covered with white moss and arctic berries. Black spruce predominates, with larch in the swamps and Banksian pine on the higher lands. There are also a few small white birches and balsam firs. One very small clump of aspen was noted.

Long Portage

The Long Portage is two miles in length, and from the creek passes S. 30° E. over a ridge 200 feet high, terminating at a small lake 150

feet above its lower end. The lower half is burnt bare, but there is at its upper end a thick growth of small black spruce, with a few Banksian pines and larches. This portage is over the watershed which divides the creek from the waters of the Pemiska Branch of the East Main River.

From the portage at its upper end, a small shallow lake is followed by a portage of one mile to a slightly larger shallow lake full of great blocks of granite, which in turn is followed by another portage of a half mile, ending in another small lake, triangular in shape. The route to here has been due east; it now turns south, and in a half mile leaves the lake by the stream flowing out, with a short portage past a small rapid at the outlet, and so into Opemiska Lake. The country surrounding the small lakes consists of low ridges of till from fifty to one hundred feet high, well covered with small black spruce and larch to the exclusion of all other trees.

Opemiska Lake is six miles long, with an average breadth of three-quarters of a mile. Its longest axis lies nearly east-and-west. The water is clear and shallow. There is one deep bay at the north-west end, full of small low islands. The shores are generally low and sandy, and the surrounding country is also low, with small ridges of till. Ten miles to the south-east of the lake, a high isolated hill rises about 500 feet above the general level, forming a conspicuous landmark; is regarded by the natives as the dwelling place of spirits, and on that account given a wide berth. The country about here is unburnt, and is well wooded with black spruce and larch, the former constituting over ninety per cent of the trees. The only other tree met with is balsam fir, found sparingly about the shores of the lake.

The Pemiska branch of the East Main River, flows out on the south side, about the middle of the lake, and leaves it with a heavy rapid. Its volume here does not exceed one-quarter of that of the river at the mouth of Long Portage Creek. The route follows the lake to its eastern end, where it ascends for two miles a small river about fifty feet wide and full of rapids, with a total fall of twenty-five feet. Three short portages are necessary to pass the strongest parts of the rapids. The country surrounding the river is low, rough and rocky, with a superabundance of loose blocks and boulders, many of great size. Two were seen resting on a rocky knoll at the head of the rapids; the larger is more than twenty feet cube, and the smaller more than fifteen feet cube.

The river ends in Wahemen Lake, another large body of water stretching to the eastward, divided by long, low ridges of till into

a bewildering number of deep bays. The route closely follows the southern shore, and, passing a small narrows, ends at a portage four miles from the outlet. The portage is 1400 yards long, and joins the river above a heavy rapid. From there to Patamisk Lake, at its head, the distance is eight miles, in a general east course. The river passes through five small lakes, each full of deep, narrow bays, and connected with the next lake by short, rapid stretches. The numerous bays and the small size of the stream makes it very difficult to follow the route without a guide.

Patamisk
Lake.

Lake Patamisk is reached by a portage of 1000 yards past a rapid in the river, which is here not above twenty-five feet wide and very shallow. This lake is the largest passed through between the East Main River and Nichicun. The route traverses the lake to the end of the north-east bay, seven miles from the outlet. Large deep bays indent both sides, and the main body is filled with large islands, which obstruct the view and hide the real size of the lake. A deep bay extends westward from a point half a mile above the outlet on the south side. The limits of the shore on the north side could not be determined, nor those of a wide deep bay on the south-east side, but the lake evidently extends to the foot of some hills about ten miles from its entrance. The water is very clear and in places deep, but as a rule shallow.

Watershed
between East
Main and Big
rivers.

A portage of 500 yards leads from Patamisk Lake to a small shallow lake one mile long, with a portage 200 yards from its east end into another smaller lake half a mile long. The portage from this lake crosses a low bouldery ridge and ends in Kawachamack or Crooked Lake, about twenty feet below the level of the last, draining into the Big River; so that the last portage is over the height-of-land between the Big and the East Main rivers.

Character of
country at the
watershed.

The country surrounding the route from Lake Opemiska to the height-of-land is everywhere the same, consisting of ranges of hills of boulder-clay seldom more than 100 feet above the general level. These are separated by wide irregular valleys filled with small lakes, so that fully one-third of this area is covered with water. An occasional rocky hill may be seen rising from beneath the masses of till, sometimes attaining a height of 300 to 400 feet. Immense numbers of boulders and loose angular blocks continue to be scattered in wild profusion everywhere. As the height-of-land is approached, the forest growth becomes smaller and less thick, and is made up almost wholly of black spruce, the largest of which are about six inches in diameter; the only other tree is the birch, which forms less than ten per cent of the whole. Where fire has passed, a number of years elapse before the

second growth of black spruce springs up, which it does then only in a thin straggling manner.

Crooked Lake, stretching N. 60° E., is nearly five miles long and averages one mile in width, with numerous small lateral bays, which give it an irregular outline. The western part is filled with islands. The north shore is almost wholly burnt and bare, while small black spruce and larch cover the hills on the south side. The country becomes higher and rougher, with more rock showing up from beneath the drift. A short portage at the east end leads directly into the south-west branch of the Big River. This river rises about sixty miles to the south and south-west, where it drains a number of lakes lying along the northern slope of the mountains, close to others emptying into the head-waters of the East Main River to the west and those of the Outardes River on the south side of the mountains. The watershed in consequence runs east-and-west here, on or near the fifty-second parallel of latitude.

Crooked Lake.

The route enters the river at a bend, where its course changes from north to east. In size it is nearly as large as the East Main River at the mouth of Long Portage Creek, being in the rapids about 200 feet wide, with deep water flowing four or five miles an hour.

Big River.

From the portage, the river flows N. 60° E. for eight miles, to the foot of a sharp rocky hill 280 feet high. It flows almost level with the general surface, and, like all the streams of the region, is made up of a series of small irregular lake-expansions, connected by short narrow stretches of swift water. Even in the widest parts a moderate current is appreciable. At the foot of the hill, the river enters a large lake that stretches several miles to the eastward, and has several deep narrow bays separated by low parallel ridges of till. This body of water is called Big Back Lake. The river flows only through its north-west part, leaving it half a mile below its entrance, and then bending sharply to the west, passes close to the foot of the hill, and enters Back Lake. From the top of the hill, looking north-west, the country as far as could be seen in that direction appears as if covered by a great number of small lakes that lie parallel to, and are separated from each other by low ridges running east-and-west. These are not separate lakes but deep bays of either Back or Nichicun lakes, these two bodies of water being separated only by a small short rapid.

Back lakes.

This rapid is five miles from the foot of the hill, through Back Lake, but the irregular shore-line of the lake must be at least fifty miles long. From the hill, the irregular outline of Nichicun Lake is seen stretching away toward the north for a great distance, bounded by

Lake Nichicun.

bold rocky hills often rising from 400 to 500 feet above its level. Through breaks among these are seen the valleys of the outlets of the lake. Toward the east, the country beyond the Back Lakes is seen rising in ranges of hills from 300 to 800 feet high, of sharper outline than the ordinary Laurentian hills. These bound the horizon to the south-east and south, and are said to form the north-east flanks of the central mountain range of Labrador which extends along the watershed in a north-east and south-west direction from the bend of the East Main River to about thirty miles east of Nichicun. Thence it gradually sinks and is lost in the general level of the country, which must there be over 2000 feet above sea-level. To the south-west and west the country is lower, with isolated rocky hills rising above the level of the low ridges of till.

Forest fires.

The only signs of an approach to the barren lands is the lack of trees on the tops of the highest hills, but the rest of the country is well wooded where unburnt. Fires have destroyed great areas of forest in this region. They are sometimes caused by lightning, and when once started, burn with surprising rapidity, travelling as quickly through the dry, white reindeer moss as over the grass of the western prairies. The Indians too are often accountable for these fires, most of which, it is likely, have been started by them, as they use smoke for signalling from great distances. Islands in small lakes are usually fired for this purpose, but brands are often carried by the wind to the mainland, and thousands of acres burnt over in a short time, the fire continuing until the first heavy rain and often breaking out afresh when dry weather again sets in. At times the Indians purposely burn large areas in order to prepare the ground for bear-hunting; for within a few years after a fire, in this region, the surface becomes thickly covered with blueberries and other small fruits, forming feeding grounds for bears during the autumn months.

Climate.

The climate at Nichicun does not permit the growth of grain, and in the small patch of land under cultivation at the Hudson's Bay post, only potatoes are grown, and these rarely if ever ripen properly, the tops being frozen early in September, or even in August. Summer frosts are also common and often severe.

Trees.

The following information concerning the trees and shrubs about Nichicun was obtained from Mr. Jos. Iserhoff, who is in charge of the Hudson's Bay post there. Black spruce is found on the shores and islands of the lake in abundance, and trees that will square six or seven inches for twelve feet, are not uncommon. White spruce is not plentiful, and is seen only in certain places along the sides of the lower hills. Balsam fir is common, and is found everywhere near the water, some of

the trees growing as large as the black spruce. Banksian pine is very rarely seen, its eastern limit being defined by a line drawn nearly north-and-south through the Long Portage, beyond which line to the eastward, only a few straggling trees are found, while on the west side it is very abundant. White birch is common about the sides of the small hills, especially where fires have passed long ago; but no trees of a size sufficient to afford bark for canoe-building are found in the vicinity, and all the bark is supplied by way of Hudson Bay. Although common about Lake Nichicun, a short distance to the north and north-east, it is very rarely met with. Small straggling aspen and mountain ash, found in little clumps at wide intervals, complete the list of trees of this interior portion of Labrador. Small fruits are very abundant, but the prevalence of early summer frosts seldom allows the fruit to ripen.

Lake Nichicun is 1760 feet above sea-level, and is a very irregularly shaped body of water, with numerous deep bays. It is so plentifully strewn with islands, that it is difficult to form an idea of its size; many of the islands are large, and one, Big Island, is six or seven miles long and about two miles wide. The greatest length of the lake is from east to west, about thirty miles, and at the western end a narrows continues on into Little Nichicun Lake, which extends several miles farther. At its widest part the lake does not exceed ten miles across, and it is so obstructed with islands there, that it appears much less. The average width is about five miles. The numerous long points stretching out from both sides, together with the islands, make it almost impossible to pass through the lake without great loss of time unless with a guide. One of its deep bays, to the south-west, heads within a short distance of the river, near the portage from Crooked Lake, and advantage is taken of this to pass the rapids in the river when travelling from Nichicun to the East Main River. The shores are low and covered with rows of boulders shoved up by the ice. The country surrounding the lake is rough, and covered with numerous ridges of boulder-clay. To the north-west, north and east, there are high rocky hills rising from 300 to 600 feet above the lake. The islands are mostly portions of boulder ridges, but some of the larger are high and rocky, especially Big Island. The water is very clear and moderately cold. As a rule, the lake is not deep and in many places it is quite shallow, with large boulders rising above the surface. It discharges on its east side, the river flowing out by three channels. The two southern ones soon join, but the northern channel does not unite with the others for nearly fifty miles, or until the river changes its course from north-east to westward.

The Hudson's Bay post is situated on an island a short distance from the inlet of the lake. This post has been long established, probably before the beginning of the present century. No record of

Size and outline of Lake Nichicun.

Nichicun Hudson's Bay Company post.

the date is known, but in 1840, a Mr. John Spencer was in charge, and made a sketch map of the surrounding country. At that time an outpost was situated at Lake Kaniapiskau. The map is now in the office of the Geological Survey, and is very interesting, as it shows the watershed between the St. Lawrence, Hudson Bay and Ungava Bay. At present the post consists of five small log buildings: the master's house, two servants' houses, a small store, work-shop and powder magazine.

Canoe route to Hudson Bay.

The supplies for the post are brought in from Rupert House by three large canoes, each manned by six Indians. In order to reach Nichicun in time to prepare for winter, the canoes leave the lake at the first open water, or about June 15th. The trip to Rupert House is made by the route to the East Main River, down it to a small lake called Nasaskauso, thirty miles below where the route to Mistassini turns off. From this lake a portage-route through a long chain of lakes is followed, and the Rupert River reached a few miles above Lake Nemiskau, about 100 miles above Rupert House, the river being descended to that place. The total distance from Nichicun to Rupert House, by the route followed, is somewhat over 500 miles. It takes two weeks to go down with the canoes partly loaded with the furs taken during the previous winter, Rupert House being reached about July 1st. Three or four days are spent there, and then the return trip up stream is commenced, and by working throughout the long summer days, from daylight to dark, Nichicun is again reached between the 15th and 30th of August. On leaving the coast, the canoes are loaded down to the gunwales, but before their destination is reached over a quarter of their loads are consumed. This gives some idea of the difficulty experienced in supplying an inland post like Nichicun.

Sustenance of the inhabitants.

Sufficient provisions cannot be brought in to support the people at the post, who have thus to depend largely on the country for food. During the summer they subsist almost wholly on fish, caught in nets in the lake, and are often for months without small luxuries such as tea, sugar and tobacco. During the winter the living is better, for then, besides the small rations of flour and other provisions, they are able to obtain abundance of fresh meat. About a dozen caribou are killed by the people of the post during the year, besides beavers, musk-rats and bears. Usually rabbits and ptarmigan are abundant during the winter season, and are shot and snared as required. In some years, however, both rabbits and ptarmigan are not plentiful, and caribou are scarce. During such seasons the food supply is very limited, and great care must be taken to prevent starvation, especially as the Indians are affected by the same circumstances and flock to

the post for relief. A supply of salt fish is laid in, every autumn, Fish. in case of need. The fish are principally whitefish and lake trout, caught with nets late in the autumn on the spawning grounds in various parts of the lake. The articles of trade in the store embrace small quantities of cloth, clothing, tea, sugar, tobacco, powder and shot.

There are about thirteen families of Indians who trade at this post, Indians. but this does not represent all the people inhabiting this portion of the interior, as a number of families prefer to descend to Rupert House and trade there, bringing in their year's supply themselves. Others living to the southward, who formerly traded at Nichicun, now descend the rivers flowing into the Gulf of St. Lawrence, and do their trading at Bersimis, Seven Islands, or elsewhere along the north shore.

These Indians belong to the western Nascaupée tribe. They speak a dialect closely resembling that of the Montagnais. The men are of medium height and fairly good physique. Some are tall and well developed, but the average height does not exceed five feet seven inches. Like other Indians they are sinewy rather than muscular. As a rule, they are less cleanly than the Montagnais, taking little care of their clothes or persons; and they generally swarm with vermin. Owing to the small numbers of caribou killed in this region, the natives are forced to clothe themselves in garments bought from the Hudson's Bay Company. They live in wigwams covered with cotton, as they cannot get either the deer-skin used in the north or the birch bark covering of the south.

The hunting grounds of the Indians of Nichicun extend from the height-of-land on the southward, to the head-waters of the Great Hunting grounds of Nichicun Indians. Whale River on the north. To the eastward they hunt as far as Lake Kaniapiskau and down its discharge about fifty miles. There appears to be quite an extensive area between their eastern boundary and the western limit of the hunting grounds of the Hamilton River Indians, who trade at Northwest River post. There is also a large area without hunters on both sides of the Koksoak River, from where the Nichicun Indians leave off, to where those from Ungava begin, as no signs of Indians were seen along that stream for nearly 200 miles. The greatest number hunt to the westward of Nichicun, or about the head-waters and tributaries of the Big and East Main rivers.

The presence of a trading post in the interior of Labrador, such as that at Nichicun, is at present absolutely necessary to the Indians inhabiting that region, and it is doubtful if the country would support half the present population without it. In seasons of plenty it is not necessary, the Indians transporting their furs to some point on the Necessity of a trading post in the interior.

coast, and returning inland with their next season's supply, but in seasons of starvation, without the aid furnished by the post, a majority of the people would die. The greatest number of deaths from starvation occur about the Rupert and East Main rivers, in the country midway between Nichicun, Mistassini, and Rupert House, where the distance is too great from any of these posts to obtain assistance during the winter. So great has been the mortality in this region, during the last few years, since the extermination of the caribou there, that the country is nearly depopulated, and a supply of provisions is kept by the Hudson's Bay Company at Lake Nemiskau on the Rupert River, to relieve the Indians in extreme cases of necessity. From the above, it will be seen, that although at present the population of the interior is small, it appears to be in excess of what unassisted nature would sustain with the present habits of the Indians.

Education and
religion of the
Indians.

The Indians of Nichicun all read and write the syllabic characters invented and taught by the missionaries of the Church Mission Society, and letters written on birch bark with charcoal are commonly seen on the portages along the various routes. The missionaries have also a number of books printed in these characters, including a selection of hymns and almost the whole of the Bible. These books are greatly prized by the natives. Although nominally Christians, their religion is greatly mixed with pagan ideas, and as their opportunities of acquiring a knowledge of Christianity is limited to the short stay every summer at Rupert House, it is no wonder that they retain many of their old beliefs. The visit to the coast is the occasion for the celebration of marriages and baptism.

Route from Nichicun to Lake Kaniapiskau.

Big River
below Lake
Nichicun.

We left Lake Nichicun by the middle discharge, on August 5th, 1893. The general direction of the stream is north-east. For two miles, to the first portage, its breadth varies from 50 to 300 yards, with swift water in the narrows. The shores are very irregular and are made up of low ridges composed almost wholly of large boulders, with little fine material. Along the river and in the small bays, are distinct traces of a terrace twenty feet above the present water-level. When the lake stood at that height, it must have covered an area nearly twice as great as it does at present, extending over a great deal of land now dry, more especially to the south and south-west.

The first portage is on the north side, following along the summit of a low ridge for 300 yards. The river here falls eight feet over a rocky ledge. Two other short portages in the next two miles pass

similar small falls over ledges of rock. The third portage terminates in a bay of a small lake-expansion, the river taking a short turn toward the north and falling into the lake about half a mile beyond the portage. The next portage is three miles below, the river in the interval varying from 50 to 800 yards in width, with numerous small deep bays running off on either side. Into one of these small bays the south discharge falls. The portage crosses a narrow point, around which the river, greatly enlarged, rushes in a heavy rapid, obstructed by many huge boulders. On both sides of the river here are sharp rocky hills rising from 400 to 500 feet above the water. Below the hills the valley widens out, and the surrounding ridges are low, with isolated rocky hills rising at intervals above them. For the next eight miles the course is north, and the river alternates from rapid narrows to small lake-expansions covered with little islands and broken by narrow deep bays. In the narrows, the river breaks into small rapids full of boulders, and has a strong current even in the widest expansions. A small lake is then entered with the river passing out to the north-west. The route crosses the lake and goes up a narrow bay for one mile and a half to its head. From here a portage of 400 yards leads to a small lake two miles long, surrounded by steep rocky hills 300 feet high. This lake is left at its east end by a half-mile portage, to another small shallow lake one mile long, surrounded with lower boulder-strewn hills, followed by another portage, a quarter of a mile long, that ends in Square Rock Lake, seven miles long, but very narrow, the average breadth being 400 yards, with small expansions at both ends and in the middle, where a small branch of the Big River flows out on the north side.

Character of
river and
surrounding
country.

Square Rock
Lake.

The lake is surrounded with hills from 200 to 400 feet high. These, like most of the country from Lake Nichicun, are burnt, and their exposed sides often appear from a distance to be solid rock, but on close examination they are found to be made up of angular masses and boulders, closely packed together. Where the forest remains, it consists almost wholly of small black spruce, with a few larches on the lower ground, and very small white birch on the hillsides. A few white spruce trees are seen growing on the low sandy terraces about the lake. The route leaves Square Rock Lake by a small stream flowing in on the south side nearly one mile from its east end. This stream comes from the eastward, in a wide valley, now filled with modified drift arranged in beds of sand and gravel, which appears to have once been the bed of a much larger stream than the present. The stream is ascended for four miles, passing on the way two short portages, where the river falls in shallow rapids from one expansion to another.

Trees.

The last portage ends in a lake four miles long and about half a mile wide, strewn with small islands of till, or stratified sand. There is evidence of a terrace twenty feet above the present water-level, and there is a good deal of stratified sand and gravel seen along the shores. High rocky hills rise from either side of the broad valley partly filled by the lake. These hills have been more than three-quarters burnt over recently, and have a very desolate appearance. The trees are somewhat smaller than those seen about Nichicun, but they still grow up to the summits of the highest hills. A short portage leads to another lake, to the eastward, a half mile up which another portage is made past a shallow narrows; then the lake widens out and continues eastward for two miles. The hills on both sides are high and are burnt bare; the boulders, having been whitened by the action of the heat, stand out in marked contrast to the blackened vegetation. A portage of 400 yards leads to Eagle Lake, on another small branch that flows into the Big River, some distance below. This river is now divided into numerous channels by large rocky islands, which thus form a net-work of lake-expansions over a wide area. Beyond this place the route is very difficult to follow, passing as it does through chains of lakes filled with islands, with deep bays branching off on both sides. The route in some places leaves the main lakes, passing by shallow narrows into large bays. The dividing up of the river into various channels, that often do not join for several miles, also leads to great confusion. Even with the aid of a map of the route, much time will be lost in following it here, owing to the sameness in appearance of the lakes and bays.

Eagle Lake.

Snipe Lake.

Crossing Eagle Lake, to its east side, one mile, the north channel of the branch is ascended one mile to Snipe Lake. Between the lakes the river is rapid and varies from ten to fifty yards in width. The latter lake is two miles and a half long by three-quarters of a mile wide, and runs northward, with a narrow bay stretching to the east for a mile from its north end. A south channel leaves the lake in a bay about one mile above the other outlet. The river again divides, giving two inlets to Snipe Lake with a large hilly island between. The lake is covered with small islands. Many of the surrounding hills are rocky and precipitous, well wooded on the south side, with many blocks and boulders scattered over them. The route follows the narrow bay to the north-east. A portage of three-quarters of a mile leads from it to another lake-expansion of this branch, eleven miles in length, which is called Long Lake, and lies about N. 60° E. It is very shallow and full of small islands, while great areas are obstructed with boulders and angular blocks of rock resting on the flat, shallow bottom. Many

Long Lake.

irregular bays indent the shore, especially on the north side where the land is low. The river flows out at the south-west end, and must be broken by a considerable fall, as the sound of it is heard well up the lake. Several small streams feed the lake, the largest flowing in on the south side. The surrounding hills are rocky and burnt over, and are lower than those about the last lake. They gradually sink towards the east end, where the country is appreciably flatter and lower, with many lakes separated by low ridges.

Two short portages and a narrow lake one mile long, lead to a lake surrounded by low, rocky, boulder-strewn hills, and stretching towards the north-east. The route passes only two miles through the west end of this lake, and up a small irregular bay to the northward. Here a portage of 500 yards ends in a small lake twenty feet above the level of the last. Half a mile beyond, another short portage is made to the last lake on the head-waters of the Big River. The route merely crosses this lake, which is large, and stretches away to the north-east, and then passes for 500 yards over a low ridge of boulders, forming the height-of-land between the rivers of Hudson Bay and Ungava Bay. The portage ends in a very large, irregular lake thirty feet below the last.

Watershed
between the
Big and Kok-
soak rivers.

From the watershed, the route runs northward for six miles, in an irregular course, through Ice-bound Lake. This is another large body of water with wide, deep bays stretching off to the north-east and south-west. The water is very clear and shallow. The east side is bounded by rocky hills about 200 feet high, while to the westward the land is low, and is probably made up of points and islands in this, or in similar lakes, in that direction.

A small stream flows eastward, from the north side of the lake, and the route follows it for six miles to Enchukamao or Male-otter Lake. The character of this stream is similar to that of others in the region, consisting of small, irregular lake-expansions, connected by short rapids, with portages past three of them. The surrounding country is comparatively low; rocky hills are seen to the eastward 200 or 300 feet high; the rest are much lower, and are composed of till. Where unburnt, the country is covered with small, scattered, black spruce, with white moss coating the ground. Male-otter Lake stretches eastward eight miles, and varies from two to five miles in width. At its east end it is split into two deep bays by a broad rocky point, that rises about 500 feet above the lake. The summit of this hill is destitute of trees and is covered with white moss. Islands are numerous, and are generally well wooded with small black spruce.

Male-otter
Lake.

Character of
surrounding
country.

On the south side bare hills of granite rise often perpendicularly from 300 to 400 feet, while similar hills bound the north side, but appear to be somewhat lower. Both sides have been burnt bare, causing the scattered boulders and blocks that cover the hills to stand out prominently. Along the base of the hills, on the south side, there is a sandy terrace fifteen feet high, marking a former level of the lake. The water is remarkably clear; this is the case with all the water north of the East Main River, and is probably due to the lack of vegetable decomposition in the swamps and small shallow lakes, which to the southward gives the water a dark-brown colour. To the northward decomposition does not take place, at least it is not appreciable, on account of the short summer season during which the heat is insufficient to warm the cold waters fed by streams from the swamps that thaw out only on the surface, to a depth of twelve to eighteen inches.

Male-otter Lake discharges by a short stream from the head of its north-east bay into Lake Kaniapiskau. The route passes up the south-east bay, to its head, whence a portage of one hundred yards, over a low ridge, leads to the great lake. The difference of level is ten feet.

Lake Kaniapiskau.

Lake Kani-
apiskau.

Lake Kaniapiskau is probably the largest in this part of Labrador. Its greatest length is from north to south, and is said to be considerably greater than that of Lake Nichicun, or above fifty miles. The lake is divided into two parts by a narrows, where the current is said to be strong. The southern part is much the larger. As the route passed only through the northern portion, nothing is known of the lake above the narrows, except from information derived from the guide. A high rocky point stretches out from the east side of the northern part, and along with some islands in continuation of it, practically divides that portion of the lake into two great bays.

Height above
sea-level.

From the hill on this point, 300 feet high, a good view is obtained, but unfortunately the smoky state of the atmosphere obscured it when we were there. From the hill, the south bay is seen extending about ten miles to the base of a conical hill of granite over 500 feet higher than the level of the lake, which is estimated to be 1850 feet above the sea. This hill puts off the view of the southern portion of the lake. To the westward a deep wide bay stretches towards the south-west to the foot of high hills in that direction. Northward from that bay, a lesser one runs close to Male-otter Lake, where the portage is. The

lake-shore then sweeps eastward along the point, which extends about five miles in that direction. The bay on the north side of the point extends to the north-westward about five miles, where the river from Male-otter Lake comes in. Near here the Hudson's Bay Company formerly had an outpost from Nichicun, but it has been abandoned for over twenty-five years. Another deep bay extends to the northward, with a channel flowing out of it, between low rounded hills

The east side of the lake is less irregular in outline, but a wide fringe of low islands extends from its north end to the narrows, with the river passing out by two channels, one opposite the point, and the other a few miles to the south. The country to the east of the lake is much lower than that on the other side, and consists of low rocky ridges, with wide valleys between, filled with lower ridges of till. The north end of the lake appears to be shallow, and is filled with islands, as is the case with the eastern half of the south bay. The western part of the latter is almost free from islands, and is said to be very deep. The islands about the southern discharges are arranged in parallel lines running north-east, and are chiefly composed of till, with many large boulders. Some are made up of stratified sand, which is also often seen resting on the till. The surrounding country is more than half burnt. The lower unburnt portions and islands are well wooded with small black spruce and a few larch trees. The summits of the high hills along the west side rise above the tree-line.

East shore of
Lake Kani-
apiskau.

Koksoak River.

The largest stream falling into Lake Kaniapiskau flows in at its south end. Its main branch rises in Summit Lake, a body of water situated on the watershed about 100 miles south of the latter. A curious feature is that it has a discharge at each end, the northern one flowing into Ungava Bay, while the southern one, is a tributary of the Manicouagan River, that empties into the Gulf of St. Lawrence. This is not an uncommon case with lakes situated along the watershed in the northern region underlain by Laurentian rocks. The river flowing north from Summit Lake is joined by many other streams, draining the lake-covered region to the south and south-east of Lake Kaniapiskau, so that the river where it flows into that lake, is of large size.

Headwaters of
the Koksoak
River.

Double dis-
charge of
Summit Lake.

As before stated, Lake Kaniapiskau has three discharges, and the route follows the middle and least rapid one. Where it leaves the lake, the channel varies from 50 to 200 yards in width; it flows

Three outlets
to Lake
Kaniapiskau.

swiftly, and is soon broken by a succession of heavy, shallow rapids, full of great boulders, the channel being cut in boulder-clay. These rapids are almost continuous for five miles, and no rock is seen in place. The south channel joins the middle one a mile and a half below the lake, and, just above the junction, makes a very heavy rapid. Below the junction, the river is 200 yards wide, and carries about twice as much water as above.

Character of
the river
below Lake
Kaniapiskau.

Below the rapid, the river, flowing north, widens out into a shallow lake four miles long and about one mile wide, with two deep bays on the west side, into one of which the north channel is supposed to empty. Northward of the lake there is a range of hills, partly wooded, while in other directions the hills are isolated and the country covered with low ridges of till. Boulders are still common, but not nearly as obtrusive as in the region west of Kaniapiskau. Leaving this lake the river narrows to a quarter of a mile, and is broken for a mile by a small shallow rapid; then, narrowing to 100 yards, it flows swiftly for another mile to a second lake-expansion. Here, widening to three-quarters of a mile, the river continues northward for two miles in a shallow channel full of sandy shoals and small islands. These islands have a thick growth of stunted trees, not over ten feet high, of black spruce, larch, balsam fir and white birch. A straggling growth of spruce covers the low hills on both sides. Next, turning north-west, the river continues in the same manner two miles and then passes into a large lake, full of islands, that extends eastward. Where the river turns east, there are two distinct terraces of stratified sand twenty and thirty feet high, with sharp conical hills of boulder-clay protruding from the highest. Along the west shore of the lake three miles, a narrows 500 yards wide is passed, leading into another lake-expansion three miles long and over a mile wide, with a deep bay toward the east. The country here is almost flat, with low hills along the eastern horizon. The river now turns northward again, and for the next three miles flows rapidly in a shallow channel about 400 yards wide, with swampy shores backed with bare hills, less than 200 feet high. Another lake-expansion, one mile across, is followed by a stretch of three miles of river ending in a lake that extends away to the westward. Passing along its east shore, the river flows out one mile beyond its entrance. Now narrowing to 200 yards, it flows rapidly north-east for two miles, then widens to 500 yards for two miles, and, bending to the eastward, flows in that direction for three miles; at two short narrows it is broken into heavy rapids where it passes over low rocky ledges. With the exception of one small hummock, this is the first rock seen below Lake Kaniapiskau, but judging from the scattered

Character of
surrounding
country.

boulders, the rocks underlying the thick deposits of drift are likely to be soft mica-schists and mica-gneisses, and this accounts for the change in the character of the country. These soft rocks having been unable to stand the abrading action of glacier ice, have been planed down, and only the harder parts rise in the low isolated ridges seen here. The granites of the region west of Kaniapiskau, being much harder and tougher, resisted the glacial action, and now stand up in the rugged hills previously mentioned.

Absence of
rock.

The river below is split into two main, and a number of smaller channels, with the stream in a shallow channel almost on a level with the surrounding flat country. Our route followed the east channel, which flows north-east four miles, and then north four miles, to the head of a heavy rapid. Two large channels join it at the fourth and eighth miles, and there is a heavy rapid between the second and third miles, with a large rocky island dividing it. When again united, the river runs north-north-east for five miles, and flowing on the surface over low, flat ledges, is almost a continuous rapid for the whole distance. Throughout, the breadth is 400 yards. Three short portages are necessary to pass low chutes.

Turning due east along the southern flank of a low range of hills, the river next narrows to less than 300 yards, and flows swiftly between rising banks of till, with outcrops of rock along the shore. Now bending east-south-east for three miles and then south for two miles, the stream narrows to less than one hundred yards, and descends in a narrow valley, cut out of till, with a rocky bottom. On the north side, the hills increase in height as the river descends below the general level, and at the lower end rise abruptly 500 feet above the stream. Those on the south side are somewhat lower. In the five miles, the river falls over 150 feet, and is very difficult to pass with canoes. The Indians of Nichicun hunt only to the head of these rapids, and below there is an interval of over one hundred miles of the river untravellered, as it is utterly impossible to ascend the stream with loaded canoes. Along this portion no portages are cut out past the falls and rapids, and in consequence portage-roads had to be made by us. At the rapid above, the sides of the valley are composed of almost perpendicular walls of till one hundred feet or more in height, resting upon jagged rocks covered with great rounded boulders for thirty feet above the water-line. These boulders are piled up by the ice passing through the gorge in the spring. The till banks at frequent intervals are deeply cut by small tributary brooks. On account of the broken character of the bank above, a portage had to be made along the water's edge over the loosely piled boulders and jagged rock. The

First gorge of
the Koksoak.

Walls of
packed
boulders.

river is here so rough, that the outfit had to be carried the entire five miles, and then the empty canoes were let down along the shore with frequent short portages past heavy pitches. A day and a half of hard work was necessary to accomplish this.

Character of
the river above
the gorge.

From Lake Kaniapiskau to the head of the gorge, the river wanders about almost on the surface of the country, spreading out into lakes, where the surface is flat, and contracting into narrow rapids where it passes between low ridges. It follows the main slope of the country, and falls with the general surface. Where it is obstructed with rapids, these are frequently over boulders without any rock in place, especially along the upper parts. The absence of a distinct valley and the presence of rapids over boulder-clay, show that the river is here flowing in a modern course, and does not follow its pre-glacial valley, which is still filled with glacial débris. At the gorge, this changes, and the river passes down from the general level into a deep distinct river-valley, probably of very ancient origin. This valley, during the glacial period was at least partly filled with till, which in scarped banks and terraces is seen along it, resting on its rocky sides. The river follows this old valley from the gorge to its mouth. The valley is, of course, not of constant depth, but descends in a series of steps, with the gradual slope of the surrounding country.

River below
the gorge.

From the foot of the heavy rapid, the river, now in a distinct valley, takes an easy bend to the east and flows in that direction for eight miles. Here the current runs from four to seven miles an hour, with constant small rapids. The river averages 200 yards in width, and descends in a valley from a quarter to a half mile wide, walled in by steep rocky hills that rise 500 to 800 feet above it. These hills are almost wholly burnt, but where unburnt are covered with a straggling growth of black spruce to within 200 feet of their highest summits. The tops are treeless, and are covered with white moss and low arctic shrubs. Boulders are now nearly absent from the sides and tops of the hills, in strong contrast to the hills about Nichicun and Kaniapiskau. Some boulders are seen, but they are so few as not to form a noticeable feature.

The lower parts of the valley are filled with drift, often extending high up the rocky hills in the cuts between them. In the drift the river has cut its narrow channel down to the solid rock below. The rock, where not covered with packed boulders, is seen along the water's edge. In many places the river-banks are formed of tightly-packed, large, round boulders, that line the side to a height of fifty feet above its summer level. These have been transported and packed in their present position by the ice passing down during the spring freshets,

and their height gives an idea of the volume and power of the stream during flood time.

Turning south-east, the river continues in that direction under similar conditions for three miles; then it turns east-north-east, and the valley and river both broaden. The river, now a quarter of a mile wide, flows in a perfectly straight course for nine miles. Owing to its greater width, the water is very shallow, and the continuous rapid is full of bouldery shoals; the deepest channel being very crooked, requires constant crossing of the stream to follow it. No part of the rapid is rough enough to be dangerous, and the only source of danger is the frequent shoals, on to which the swift current quickly carries a canoe, if a sharp outlook is not kept. The packed boulders still rise from thirty to sixty feet above the water, with stratified sand and fine gravel, up to seventy feet, where a distinct terrace is seen, marking an older level of the river. Along the margin of the water there is an almost continuous exposure of solid rock. The hills are less precipitous, especially on the west side. The valley is filled with drift, of which sections are seen along the banks. The river now turns north-east for four miles, and broadens slightly, the rapids giving place to a strong, steady current of nearly six miles an hour. A mass of ice, twenty-five feet long and six feet thick, was seen at the bend on the north side, piled up on a great quantity of packed boulders, sixty feet above the water, the remains of a great mass shoved there by the freshet in the spring, and left by the receding water. But a short time before, it had covered an area of over 100 yards square, but at the time (August 16th), it was melting quickly. Similar masses were seen along that shore for a mile below; they were all about thirty feet above the level of the water, and the largest was 200 feet long by thirty feet wide.

Both shores remain rocky, the rock coming out from beneath the packed boulders. On the west side, near the lower end of the course, there is a well marked terrace, seventy-five feet above the water, that is seen extending downwards for two miles. In places it is flanked by a lower one forty feet high, with the boulders often packed to the top of it. The hills forming the sides of the valley are now about 500 feet high, and this nearly represents the height of the surrounding country, as all the little streams entering the river do so with falls from small cuts slightly lower than the summits of the hills. From the head of the rapids at the gorge, to this place, the river has fallen 420 feet without any direct drop exceeding four feet. The grade is nearly constant, and exceeds ten feet per mile.

The river next once more bends to the southward, and flows south-east for six miles, with a strong current, in a slightly wider and lower valley. A large brook comes in from the eastward at the fourth mile.

Trees.

For the last twenty miles the country on both sides is unburnt, and is covered with scattered black spruce and a few larches, never more than twenty feet high or exceeding nine inches in diameter. The tops of the hills rise from 100 to 200 feet above the tree-line. Turning again directly east, the river flows in that direction for six miles. The channel along here is wide and shallow, being filled up with sand and fine gravel, borne down by the strong current above and deposited over the flats of this part. Sandy shoals rise slightly above the water in places. The hills on both sides are slightly burnt and are lower, with gentler slopes towards the river than those further up stream. Rock-exposures are less numerous, and the ice does not bank the boulders on the shores to more than fifteen or twenty feet high.

Parallel valleys.

After a bend to the east-south-east, a small rapid is passed, and three miles below a little river falls in on the south side. This is the first tributary of any considerable size that joins the main stream below the commencement of the river-valley proper, and there must be only a narrow strip on either side draining into the river, the rest of the country probably being cut up into parallel valleys, with watercourses in each, which only join the main stream at long intervals. The small branch comes in with heavy falls, along the side of a rocky hill of 800 feet. Below, the river again flows eastward for three miles, with a strong current, and has a terrace of thirty feet on the south side. A bend of a mile and a half to the north-east is followed by another long stretch to the eastward. A heavy rapid, four miles long, begins at the upper part of the north-east course. Then the channel broadens somewhat, and the current is considerably slacker for the next eight miles. The valley here slopes gently upward, on both sides, and is partly filled with drift. The hills are high, those on the south side rising from 600 to 800 feet, with well marked terraces at sixty and thirty feet, cut out of the drift along their flanks. The north side is unburnt, and the trees are all small, stunted black spruce, that grow to within 200 feet of the summits.

Riverterraces.

The general course for the next ten miles is east-north-east, and, the valley narrowing, the river for the first six miles is a succession of heavy shallow rapids, full of boulders. Along the flanks of the hills on the south side, several distinct high-level terraces are seen at 30, 60, 75, 100 and 150 feet above the present river-level. The upper ones are broken, and only the lowest two are continuous. Below the rapids the river widens to more than half a mile, and is correspondingly

shallow, with a sandy bottom. The hills on both sides now gradually lower, and those on the south side retreat, leaving a wide, low, drift-covered valley between their base and the river. A bend of two miles to the south is followed by a stretch towards the east five miles long. At the foot of the first bend there is a rapid of three-quarters of a mile where the river is over half a mile wide, and is in consequence very shallow. Below this rapid the river is nearly a mile wide, and flows with a strong current until it reaches the base of a low range on the north side, where it narrows to 400 yards and is broken into heavy rapids. The river now appears to break through this low range 200 to 400 feet high, and in doing so bends sharply to the south-east for two miles, then north-east two miles, again south-east two miles, and finally south for three miles, passing out into a broad valley, where it is joined by the Katakawamastuk or Sandy River, a large branch from the eastward. While passing through the hills, the river forms a continuous strong rapid, culminating in a twenty-foot chute a short distance above the forks. Although the river descends rapidly, it does not fall as quickly as the general level of the country here, and, in consequence, below the forks it flows nearly on the general level, with only low rounded hills seldom more than 100 feet above its shallow valley.

In this manner it flows eastward for five miles, with only one small rapid, to the head of a rocky gorge. From the head of this gorge a very distinct drop is seen in the country to the eastward, with high hills that appear to be on the level with the land about the gorge bounding the horizon. At the head of the gorge the river is split up by little rocky islands into a great number of small channels, and it passes through them in a succession of small chutes or heavy rapids, gradually collecting into one channel; after half a mile, the stream, a mass of foam, rushes down a narrow gorge from thirty to one hundred feet wide, with perpendicular rocky walls from 50 to 100 feet high. In one mile the river falls 110 feet without any direct drop of more than five feet. The portage passes over the bare rock on the south side. Below the gorge, the channel widens to half a mile, and continues eastward, with strong current and flat rapids for three miles. Here again narrowing to 100 feet, it falls thirty feet into a narrow rocky gorge, which was named Eaton Cañon, and turning directly south, rushes down between jagged perpendicular walls with a width varying from fifty to one hundred and fifty feet. As the stream descends, the banks rise and become 200 feet high a quarter of a mile below the first fall. Here the river turns sharply to the north-east and continues as a rushing torrent, through a deeper and still

narrower gorge, with overhanging walls of red granite on the east side. The overhang is so great, that a stone dropped from the top on this side would almost reach the foot of the opposite cliff when it struck the water 350 feet below. After falling in this manner for a third of a mile, the river widens to a hundred yards, and changing its direction to east, descends less abruptly for a quarter of a mile, while the walls of the cañon are a hundred feet lower, and much less abrupt. Next, turning north, it makes a direct fall of a hundred feet into a circular basin about fifty yards in diameter. Nothing but seething water and foam is seen in this rocky basin, which resembles a gigantic boiling cauldron. A small brook, on the north side, also falls into the basin, descending the perpendicular wall in a cascade 200 feet in height. The river leaves the basin by a narrow rocky channel, rushing out with a fall of thirty feet in immense waves that gradually subside in a second and larger circular basin at its foot, where it widens to 150 yards. On each side of the central current there are strong eddies rushing up to join the down stream, where it passes out from the basin above; and, where the conflicting currents meet, great whirlpools are periodically formed. A small rocky island divides the river into two narrow channels where it leaves the larger basin, whence it flows north-east for two miles, and then gradually bending south in the next mile and a half, still a hundred yards wide, it rushes along in heavy deep rapids, between vertical walls of granite capped with drift that rise from 100 to 300 feet above its surface, until it suddenly bursts out into a wider valley running north-north-east, with a large branch called Goodwood River flowing down it from the southward.

Goodwood
River.

Portage past
Eaton Cañon.

The portage past the cañon was made along the east side, leaving the river above the first fall, coming out on the top of the bank at the sharp bend to the north-eastward, and thence striking due east for a mile over low rocky hummocks, with swamp between, and descending the steep rocky course of a small stream to a narrow valley 200 feet below. It then follows this valley for half a mile to a small lake, after crossing which a portage of 150 yards leads out through a narrow gorge, with perpendicular walls 160 feet high. Large masses of rock have fallen from above and have filled the valley completely to a depth of seventy-five feet. The small river passes under this mass of broken rock, and in so doing falls twenty-five feet, to where it enters the main stream on the south side of the larger basin at the foot of the cañon. Over this mass of broken rock canoes and outfit were carried, as there was no other place where the main valley could be entered, and the difficulty of the undertaking may be imagined when it is stated that over half a day's labour was required to pass these 150 yards of broken rock.

In the small valley, the trees are much larger than any seen since leaving Lake Mistassini. Growing on a rich alluvial soil along the banks of the brook, is white spruce eighteen inches in diameter at the ground and sufficiently long to make two twelve-foot logs. The trees are, however, very knotty. Larch of similar size is also seen here, along with white birch eight inches in diameter. The first white spruce on the banks of the river was found on a low bank of sand and gravel at the mouth of the Sandy River. Below that point, small trees of this species are commonly found growing on the lower terraces of stratified drift. The higher lands support only a small growth of black spruce and a few larches. Large trees.

Below the junction of the Goodwood River, the main stream runs north-north-east for six miles, with a rapid current, in a channel 300 yards wide. On the west side there are scarped banks of stratified drift one hundred feet high; and rocky shores on the east side are capped with drift and have two well-defined terraces at 60 and 100 feet above the river, the lower terrace being cut in fine sand and grown over with fair-sized white and black spruce. Four or five miles beyond the lower end of this course there is on the east side a range of bare rocky hills over 1000 feet high. Widening out to nearly half a mile, the river then turns north, and for fifteen miles flows with a moderate current in a shallow channel filled with sandy shoals. The eastern bank is very rocky, and from 200 to 300 feet high, with patches of sand along the gulleys where the brooks tumble in. These rocky banks form the foot-hills of the barren range before mentioned. The west side has also high and in many places rocky banks, but the country behind is much lower than on the other side, with a few isolated hills more than 500 feet high. On this side the surface is mostly unburnt, with fair-sized black and white spruce and larch growing on the stratified sands of the terraces, but with only a scant, straggling growth of black spruce on the rocky and drift-covered hills above. River below Goodwood River.

Remains of terraces are seen along both sides at 10, 60 and 75 feet, that at 60 feet being the most constant. Contracting now to less than one hundred yards in width, the river falls eighty feet over a ledge of rock at the Granite Fall. Two small rocky islands divide the stream into three channels, the largest being on the north side. There is a first chute of twenty feet followed by a perpendicular fall of sixty feet in the smaller channels. In the main channel, a large mass of rock broken away, is apparently lodged at the foot of the fall, as the water dashes up from below in a great wave forty feet high. The river falls into a beautiful, circular basin, nearly half a mile in diameter, formed by a deep semi-circular bay on either side. Granite Fall.

bays are surrounded by well wooded, perpendicular cliffs 200 feet high. A wide beach of small, well rounded boulders, rises sharply from the water and stretches for sixty feet to the foot of the perpendicular walls.

Deep channel
cut in drift.

Below the falls the river again passes into a deep valley less than a mile wide, with rocky walls that often rise sheer from 800 to 1000 feet. This valley during the glacial period has been partly filled with drift and the river has since cut into it a narrow channel, with high scarped banks of from 100 to 300 feet, with terraces from 50 to 150 feet above the present level. The direction of the valley is nearly north-west, and the river, about 300 yards wide, rushes down it in a zigzag. At every bend the stream strikes against the rocky walls, while a low bar of large, round water-worn boulders extends out from the opposite shore, throwing the waters with force against the rocky banks, and forming deep wild rapids at these points. In this manner the river continues falling rapidly for ten miles; then the valley gradually widens and there is a considerable interval of drift-covered land between the river and the rocky hills on the east side, where terraces at 20, 50 and 100 feet are seen, cut in the drift. The west side is still bounded by rocky hills, that rise about 400 feet. In the valleys of small streams cut into the drift, and on the terraces, white spruce trees forty feet high and eighteen inches in diameter are not uncommon.

Balsam
poplar.

This valley continues from three to five miles wide for twenty-five miles and is remarkably straight, the course being about north-west. The river skirts its west side, where it flows close to the base of the rocky walls, that rise from 200 to 400 feet above it. For seven miles it does not average over 400 yards in width, is very shallow and greatly obstructed by sand and shingle bars, over which it breaks into rapids. At the end of this stretch, a small river comes in from the west, through a deep narrow cut in the mountains. Terraces are continuous along the east side at heights varying from 20 to 150 feet above the river. Balsam poplar trees forty feet high and ten inches in diameter were seen on the lower terraces, along with white spruce trees sixty feet high and over eighteen inches in diameter.

Death River.

Below this branch, the river soon widens out to more than a mile, and is broken by sand bars into a number of wide shallow channels. The bottom is formed of shifting sands. The banks are lower and are composed of stratified sand cut into terraces. The current is slacker, and at the end of fourteen miles another and larger branch, called the Tipa or Death River, comes in from the west, joining the main stream by three channels, as it falls over a low ledge of gneiss. Below this tributary the river narrows somewhat, but still

remains shallow, with lower banks, for four miles; then, narrowing to less than 400 yards, it bends to the northward into the head of Cambrian Lake, which is about two miles wide and surrounded by high rugged hills of Cambrian rock.

In fourteen miles, the lake gradually sweeps round from north to north-west, and at the end of the curve, another small branch from the west flows in from a wide valley between high barren hills that rise from 800 to 1200 feet above the water. Cambrian Lake.

The physical aspect of the country changes as soon as the Cambrian area is entered. Where the underlying rock is Laurentian gneiss or granite, the hills, though often high and with perpendicular sides towards the river-valley, always have rounded tops, with long gently curved outlines, while the hills formed from the stratified Cambrian rocks, are much sharper and more rugged. Character of the country.

The general dip of the rocks is towards the north-east, and, in consequence, the mountains which they form show steep cliff faces towards the west, with long gentle slopes on the opposite side. These hills run in ridges roughly parallel to one another and to the general strike of the rocks, that is, from south-east to north-west. They rise from 800 to 1500 feet above the surface of the lake, which is about 400 feet above sea-level, and on the western side often have perpendicular cliffs over 500 feet high, with a great talus of broken rock at the bottom. The cliff-faces have generally a reddish colour, due to the oxide of iron present in all the rocks of this series. All except the lower slopes of these hills are barren, or covered only with arctic shrubs and mosses, with patches of snow in gullies near their summit; this adds greatly to the grand and desolate scenery, while the beauty of the pleasant, wooded valley of the river is enhanced by the contrast.

From the entrance of the small branch, the valley again turns northward, and continues in that direction for eleven miles, to where the lake gradually changes into the river again, with high hills on the east side, in which the Cambrian rocks are seen resting on rounded masses of gneiss. The hills on the west side retreat, leaving a wide sandy plain, through which a large branch called the Piachikiastook or Ice-dam River flows, entering the main stream with a heavy rapid two miles above the end of the course. The main stream gradually narrows, and becomes shallow along the lower part of this stretch, where it runs between low banks of sand. Turning next to the north-east for seven miles in a wide sandy valley, it flows along with increased current in a shallow channel three-quarters of a mile wide, until it reaches a barrier of black shale and limestone, Ice-dam River.

Shale Falls. where it falls sixty feet in about 200 yards, at the Shale Falls. Below the falls, there is a circular basin with steep sandy banks sixty feet high, and from it the river passes out to the north, and flows in that direction for two miles between terraced banks sixty feet high covered with large spruce, with outcrops of iron ore showing beneath the sand along the water's edge.

Swampy-bay River. Gradually bending around to the north-west, the river flows in that direction for twenty miles, until it is joined by a large branch from the eastward called the Swampy-bay River. By this stream, the Indians formerly travelled to Fort Nascaupsee, which was situated on Lake Petitsikapau on the upper waters of the west branch of the Hamilton River, and only a few miles from the watershed separating it from the Swampy-bay River. Along the first five miles of this course, the river is about half a mile wide, and flows between sharp rocky hills, which rise 600 to 800 feet above it. Here an almost continuous exposure of bedded iron ores is seen, consisting of red and specular hematite, magnetite and siderite, interbedded with siliceous limestones and jasper. After five miles, the hills retreat on both sides, leaving a wide valley of drift, through which the river runs with a steady current in a shallow channel half a mile wide. The drift is cut into terraces at 30, 50, 100, 150 and 300 feet. A small branch from the east flows in here.

After four miles the hills again approach the river on the west side, where they are sharp and rugged and rise from 600 to 800 feet in precipices often terminated in sharp peaks. Two miles above the forks there is a strong rapid half a mile long, where the river narrows to less than 200 yards. The sands in the valley are greatly drifted by the winds, and in one place the drifts are covering up trees twenty feet high. The country is nearly all burnt from the falls to the mouth of the Swampy-bay River.

Character of
river below
Swampy-bay
River.

For eight miles below the Swampy-bay, the main stream flows north-west in a narrow valley, between sharp rocky hills, from 400 to 600 feet high. The river-channel is from 200 to 600 yards wide, and the current is strong. The lower parts of the rocky hills on the east side, are covered with sandy drift and are terraced at several levels up to 200 feet above the present height of the river. The hills on the west side rise directly from the water and have very little drift on their flanks.

The river next turns north-north-west for seven miles, and then north for seven miles more. Along the upper of these courses the valley widens to over two miles, and is filled with drift, terraced to the 200 feet level, behind which it slopes gently upwards with a few sharp

rocky hills projecting above it. Along the second course the land on the east side is only about fifty feet high, for three or four miles to the base of the hills. The country on the west side is higher and the hills come out at intervals along the river, with a large brook flowing in from the west, about two miles from the upper end of the course. The river here widens out to nearly a mile, and its current is not strong.

Along the last mile, the river narrows to 400 yards and flows swiftly between hills of limestone from 200 to 600 feet high, very sharp and irregular in outline. The rock has the appearance of being greatly faulted. Turning now sharply to the north-east, the river continues to flow swiftly in a narrow, rock-bound channel for three miles, where it again turns northward, and continues in that direction ten miles to the Pyrites Chute where it falls thirty feet in a half mile over black shales on edge. Along the upper half of this course, the limestones are almost continuously exposed along the river-banks, rising in sharp ridges on both sides from 100 to 800 feet high. Along the lower half, the hills retreat and leave a wide sandy valley, covered with black and white spruce with a few larch and white birch. The largest trees rarely exceed twelve inches in diameter and are much shorter than those seen about the Cambrian Lake.

Below the chute, the course is north-west for fifteen miles. For four miles the channel averages three-quarters of a mile in width, and the surrounding country is low and flat, with sharp hills of rusty rock and a few exposures of limestone on the east side. A number of low islands of limestone occur in the next mile, at the end of which the river, at the Limestone Falls, descends sixty feet over ledges of that rock, which cross the river-valley obliquely, and form a dam over which the water pours in three main channels. The middle channel follows the strike of the rock and forms a chute, while the other two fall vertically, directly across the strike. Below the falls, for four miles, the river, about a half mile wide, flows between scarped banks of sand and gravel seventy-five feet high; and then, narrowing to less than 200 yards, for five miles it rushes through a narrow valley called Manitou Gorge, cut out of limestone and shales, with walls from 50 to 300 feet high. Heavy rapids are met with throughout the gorge, and considerable danger was encountered running these with half loaded canoes, especially at the lower end, where outcrops of limestone cross the valley, hemming the water into narrow channels and causing small chutes. Below the gorge, the river for six miles gradually bends towards the east until it is joined by the Natwakami, Larch or Still-water River, a large branch from the west. Along this portion the current is strong, and a number of large islands of sand and shingle

Stillwater
River.

divide the river into several channels. The banks are cut out of clay, overlain by sand, and often over one hundred feet high. As the forks are approached, the banks on the west side become lower, and form a broad sandy plain between the two rivers. The Stillwater River has about half the volume of the main stream, and flows in from the westward, through a wide valley. There must be a considerable quantity of clay along its banks, as its water is quite muddy, in marked contrast to the clear water of the main stream.

Route to
Hudson Bay.

By this branch the Indians journey to Hudson Bay. They follow it to its head, and cross from there to Clearwater Lake, and by the discharge of this lake reach Richmond Gulf. The Rev. Mr. Peck, a missionary of the Church Mission Society, crossed by this route in 1885, and the first expedition of the Hudson's Bay Company to Ungava, traversed the same route from Hudson Bay in 1824.

Character of
river and
country below
the Stillwater.

Immediately below the Stillwater, the river turns to the north-east, and for five miles is less than a half mile wide, flowing with a swift current between low, terraced banks in a valley two or three miles wide, bounded by sharp hills from 500 to 600 feet high. These hills, still composed of Cambrian rocks, run in sharp ridges from a quarter of a mile to two miles apart. The direction of the ridges is roughly at right-angles to that of the river. They resemble one another very closely, and sixteen of them were noted in as many miles. They have a cliff face towards the south-west, and a gentle slope towards the north-east, apparently coinciding with the dip of the rocks. All the cliffs show a thick capping of hard rock, probably trap, with rusty weathering shales beneath. On the steep side, the hard capping rock often projects beyond the softer shales, and so forms overhanging cliffs. The lower valley, where unburnt, is wooded with small black and white spruce and larch, growing in open glades upon the terrace. These trees also grow on the hillsides, up to about 200 feet above the river. Above this, only mosses and arctic shrubs are seen about the watercourses, the remainder being naked rock, which forms over one half of the area under consideration. Ten miles below the Stillwater, a small river comes in from the westward. The valley, five miles below the forks, widens to five or six miles, and the river spreads out to over a mile, becomes very shallow, and is greatly obstructed by sand and shingle shoals, as it flows along with a strong current, in the same direction for twenty-one miles.

Trees.

Toward the lower end of this reach, the sharp Cambrian hills give place to others of Laurentian rock, whose outline is less rugged and more rounded. The interval between the river and the rocky hills is

occupied by a terraced sandy plain from twenty to fifty feet above the river and is partly covered with small trees.

Low ledges of gneiss now cross the stream and form a number of small rocky islands, causing a heavy rapid for nearly a mile, followed, two miles below, by another a quarter of a mile long. At both rapids, the water is shallow, and the channel is obstructed by reefs and large boulders. The foot of the second rapid marks the head of tide-water. Head of tide-water.

From here the course changes to east-north-east for eighteen miles. The hills on both sides retreat still farther, and appear to be considerably lower. The river is now from two to five miles wide, and is broken into numerous channels by long low islands of sand, and shoals bare at low water. The river banks are from ten to twenty feet high, with a wide drift plain extending to the foot of the bare, rocky hills, on which the remnants of terraces are seen up to 300 feet above the present water-level. This plain is only partly wooded with small black and white spruce, and but two clumps of small balsam poplar were seen on the north bank. Turning again to the north-east, the river becomes still wider, with a deep bay on the north side, around which the rocky hills sweep; these then cross the river seven miles down the course, where they form a number of high rocky islands, that hem the water into deep channels, through which it rushes rapidly in and out according to the state of the tide. At and below the islands, the river varies from a mile to a mile and a half in width, and its valley is bounded by rounded rocky hills, rising from 100 to 300 feet directly from the water, with only in a few places a narrow border of drift between, which is sometimes terraced one hundred feet above the present sea-level. The course continues nearly north-east to the mouth of the river, some twenty miles below.

Fort Chimo, the Hudson's Bay Company's establishment, is situated Fort Chimo. facing a small cove on a low terrace on the south shore, about two miles below the islands. The terrace is about 200 yards wide, and is backed by low rounded hills of gneiss. Small black spruce trees grow only in protected hollows about the post, and the general aspect is very uninviting, with barren, rocky hills bounding the horizon on every side. The post consists of about a dozen buildings, including a dwelling house for the officer in charge, four or five for the servants, a trading shop, office, two provision stores, oil shed, salt shed, carpenter, cooper and blacksmith shops and a dwelling house for the Indians. These buildings are all, or nearly all, made of imported lumber. There are a number of small boats attached to the post, along with a small sloop and a steam launch, used in connection with the salmon fishery. At present a vessel of about twenty tons is being built there,

from wood obtained about Ungava Bay ; most of it coming from some distance up the Whale River, which is the next large stream flowing into the bay to the eastward. Firewood for the post is cut during the winter in the vicinity of the first rapid, and is rafted down the river in summer.

The post is supplied by the company's steamer "Eric," which arrives at Fort Chimo about the first week in September, and remains there, loading and unloading, for about two weeks. This is the only communication with the outside world, and when the ship leaves, all touch with civilization is lost until the following year.

Fur trade.

The fur trade is, of course, the most important, and is carried on both with the Indians and Eskimo. Foxes are the most numerous of the fur-bearing animals, and are found throughout the barren and wooded country ; they occur as to numbers in the following order : white, red, cross, black and blue. Martens come next, and are chiefly taken by the Indians along the edge of the wooded country, about the head-waters of the rivers. Their fur is very thick, dark and long, and the skins are generally larger than those caught farther south. Wolverines are common along the edge of the barrens and northward. White bears are killed frequently along the coast. Black bears are very rare, and specimens of the barren-ground brown bear are obtained only at infrequent intervals. Mink and otter are not common, and the beaver is not found north of the thickly wooded area. Formerly a great number of dressed caribou skins were traded at Ungava ; but during the last two years very few were brought in, owing to a change in the routes of migration of that animal.

Salmon fishery.

The salmon fishery is carried on at a number of places along the river, below the post, during the month of August, and the annual catch averages one hundred tierces for export. Salmon are also taken in the mouths of the Whale and George rivers, the average catch at the former place being fifty tierces, and at the latter one hundred and twenty tierces. Formerly the company employed a small refrigerator steamer in this trade at Ungava, and the frozen salmon were taken to London for sale. This has been abandoned for several years, and the salmon are now split and salted. The white porpoise is also taken at Ungava, on the Leaf River, a stream a short distance north of the mouth of the Koksoak, and at George River. The total amount of oil so obtained is about eighty tierces of forty gallons each. Other articles purchased are feathers, ivory and eider down.

Seven years ago there were ninety families of Indians trading at Fort Chimo. But in the famine, due to the failure of the caribou

hunt, during the winter of 1892-93, nineteen families starved to death in a body, and at another place six families were totally lost; besides these, all the other Indians were throughout the winter in a state of chronic starvation, and many died, so that out of a population of two hundred and fifty persons, less than one hundred and fifty survive.

Hamilton Inlet.

Hamilton Inlet, Invuktoke, or Esquimaux Bay is the largest and most important of the many long, narrow fiords or inlets indenting the Atlantic coast of Labrador and Newfoundland. Its greatest length, from Indian Harbour to the mouth of the Hamilton River at its head, is slightly over one hundred and fifty miles, while its average breadth is about fourteen miles. The longest axis lies north-east and south-west. At its mouth, from the mainland near Purple Island, on the north shore, to Grinder Point, on the south side, the distance is twenty-three miles. Thence the inlet gradually narrows for forty-three miles to the mouth of the Double Mer, where the width is less than two miles. Here the inlet is divided by a long rocky ridge, the northern portion, or the Double Mer, extending westward some forty miles. A narrow, less than one mile wide, extends from the point five miles into the main, or Groswater Bay. Again widening, the channel is divided by a large rocky island five miles long called Henrietta Island. At its head, on the south side, a long narrow bay, called Back Bay or Backway, runs off to the eastward for about twenty-five miles, with an average breadth of four miles. At the east end of this bay a ridge one hundred and fifty feet high separates it from a small lake, with a sluggish brook that empties into a bay on the coast. The total distance between the head of the bay and the sea coast is not over ten miles; the country between appears to be wholly formed of drift material, and it is quite probable that in pre-glacial time there was an opening of the coast here.

The main bay above Henrietta Island quickly expands to four miles, and then more gradually to twelve miles, at the mouth of Valley Bight, eighteen miles above the narrows. Valley Bight is a small bay on the north side, about three miles wide at its mouth, and gradually narrowing for five miles to its head. From the mouth of this bay the main body has an average breadth of eight miles as far as Charley Point, some eight miles up. This portion is greatly obstructed by islands, of which Neveisik, St. John and Haines islands are of large size, and are also high and rocky. From Charley Point

Mulligan Bay. to Mulligan Point the distance is thirty miles, and the average breadth of this portion is fifteen miles, with two large bays, one on each side. That on the north side is called Nebavick or Mulligan Bay, and extends behind the long, low point of the same name. It is about four miles wide at its mouth, and of about the same depth, with a small river coming in at its head. The bay on the south side is called Etagaulett or Big Bay; it is ten miles wide and nearly five miles deep.

Northwest River. From Mulligan Point to the mouth of the Northwest River, some twenty-three miles, the breadth gradually decreases to eight miles, and considerable intervals of low sandy land intervene between the water and highlands behind, while the waters on both sides are shallow, and are greatly obstructed by sandy shoals and low islands, especially on the north side, where a fringe of islands extends several miles out from Mulligan Point to within four miles of the mouth of the river. The Northwest River flows in at the foot of a small shallow bay, and at its mouth is about 100 yards wide, with an average depth of fifteen feet. The narrows are only half a mile long, and then the river expands into a shallow lake, one mile wide and three miles long, at the head of which is another contraction of about 400 yards, with a strong current where the river flows out of Grand Lake. This is a large body of fresh-water extending westward some forty miles, and is from two to five miles wide, and very deep. As only a comparatively narrow strip of low sandy land separates this lake from the bay, and the sand has probably been deposited there by aqueous or glacial agencies, it is probable that at no very remote time the lake formed an extension of the present inlet.

Kenamou River. On the south side, immediately opposite the mouth of the Northwest River, is Carter Basin. This is about three miles long and a mile and a half wide, and is connected with the main body by a channel little over one mile long. Into this basin two rivers empty, the larger or western one is called the Kenamou River. It is a large stream that rises on the highlands to the south-west, where its sources interlock with those of the St. Augustine and Natashquan rivers, which empty southward into the Gulf of St. Lawrence. The Indians report that it flows through a deep valley in the Mealy Mountains and is unnavigable with canoes, owing to the almost continuous, steep, shallow rapids. No high falls are reported on this stream. The smaller stream is called the Kenemich River, and takes its rise on the top of the Mealy Mountains only a short distance inland, to the south and south-east of its mouth. It descends the steep sides of the hills close to its mouth in a succession of high and beautiful waterfalls.

From the mouth of the Northwest River, the shore trends southward nine miles to the end of Sandy Point, a low, broad expanse of sand stretching this distance out from the north side, evidently the remains of drift brought down by the Hamilton River. Opposite Sandy Point the bay is only three miles and a half wide, and shoal water, caused by an extension of the point, continues to the south side, with only eighteen feet of water at the deepest part, where the channel is less than a half-mile wide.

Beyond the point, the shore again trends northward, forming Goose Bay, which averages nine miles in width and is nearly twenty miles long, to the head of Terrington Basin, where Goose Bay River flows in. This is a shallow stream, draining a considerable area of country between the Grand and Northwest rivers. Goose Bay is in most places quite shallow, being filled up with sand brought down by the Grand or Hamilton River, which flows in on the south side, nine miles above Sandy Point. A low sandy point, about five miles wide, separates the river from the upper part of Goose Bay.

The country surrounding Hamilton Inlet is generally high and rocky. On the north side, commencing at the entrance to the bay, the hills range from 100 to 400 feet, and are only partly wooded with small black spruce, in the valleys and on the protected sides. As the narrows are approached, the land rises from 200 to 500 feet, and continues between these heights, until Valleys Bight is passed. Beyond, it is still higher, seldom under 500 and often over 800 feet, forming a high rocky ridge separating Double Mer from the main bay. Fifteen miles above Charley Point, the hills pass inland around the head of Mulligan Bay, leaving a wide interval of low land between their bases and the shore.

Character of
surrounding
country.

Still continuing inland, the hills cross from the head of Mulligan Bay to the shores of Grand Lake, and are more irregular in height and outline than below. One hill called Mokami, or Kokkak, rises in an imposing cone of over 1000 feet, with bare rocky sides and top, forming a conspicuous landmark, said to be visible from any high hill, within a radius of seventy-five miles. The hills above Northwest River skirt the north side of Goose Bay, and gradually close in beyond it, to form, with those of the south shore, the wide valley of the Hamilton River.

Mokami Hill.

The country along the south side of Hamilton Inlet at its entrance, is comparatively low and swampy. The hills first reach the shore about fifteen miles below the narrows, and then follow it closely to the mouth of Backway. Along the narrows they rise abruptly from 500

Monat. to 1000 feet, and in places are flanked with sandy terraces up to 150 feet above the sea. Along Backway they average 600 feet, and culminate in a rounded conical peak called Monat, over 1000 feet high.

Mealy Mountains. On the other side of Backway there is generally an interval of low land, rising in terraces to the foot-hills of a high, barren range called the Mealy Mountains, that occupies a large area of country between the south side of Hamilton Inlet and the head of Sandwich Bay. These mountains rise precipitously from 800 to 1200 feet along the side of the inlet, without any low land, from the mouth of Backway to within ten miles of the mouth of Carter Basin, where they pass inland, and ultimately form the south wall of the Hamilton River valley. Along the inlet the sides and tops of these hills are almost totally devoid of trees, owing to the blasts of the prevailing cold north-west wind that sweep across the bay, especially during the winter season. Inland, it is reported that small trees grow abundantly in protected valleys. As the head of the inlet is approached, the trees are seen to cover the lower slopes and to rise higher and higher, until near the mouth of the Hamilton River, they are found extending to the very tops of the hills, here from 600 to 800 feet high.

George Island. Below the narrows, the inlet is obstructed by a number of large rocky islands; of these the most conspicuous is George Island, which lies about six miles off the south shore, at the entrance. It is nearly four miles long and in its highest point 750 feet above sea-level. A number of smaller islands are clustered along the shore, on the north side at the entrance, and Indian Harbour, an important cod fishing station, is situated among these. From the entrance the inlet is practically free of islands to within half way to the narrows, where it becomes obstructed by several large ones scattered up its middle. The islands above the narrows have been referred to previously as extending as far as Charley Point.

Depth of water. Below the narrows, the greatest depth laid down on the chart is fifty fathoms, and the average depth is about thirty fathoms. The channel at the narrows and on the north side of Henrietta Island, ranges from ten to twenty fathoms in depth. Above, the water rapidly deepens, and soon shows ninety-two fathoms; it continues very deep to beyond Mulligan Bay, where it begins to shoal, especially along the shore, a fact probably due to the filling up of the bottom with material brought down by the large rivers emptying into the head of the bay. Twenty fathoms appear to be the average depth of the deeper parts to nearly opposite Northwest River, then it rapidly shoals to fifteen and to five fathoms, until the bar at Sandy Point is crossed, after which slightly

deeper water is found, which again shoals gradually to three fathoms at the mouth of the Hamilton River.

At Indian Harbour the tide rises seven feet at springs; at the lower end of the narrows the rise is four feet, while above the narrows the rise is only about two feet and continues the same to the head of the inlet, where the rise and fall of the tide is much modified by the direction and strength of the wind. Below the narrows, there is a strong current formed by the ebb and flow of the tide; while through the narrows the rising and falling water rushes with a velocity varying from four to seven miles an hour, and in a number of places heavy rapids occur, which, with whirlpools and eddies, render the passage of small boats dangerous when the current is at its strongest. Above the narrows, there is no perceptible current, except that caused by winds. The shores of the outer part of the inlet are partly wooded with small black spruce and larch, while the hills and islands support only a growth of low arctic shrubs and willows. As the narrows are approached, the trees become larger and on the protected north side cover the hills to their tops. White spruce, balsam fir and small white birch are seen. Continuing up the bay, the trees become larger and better until on the low lands about its head, plenty of trees of the above species grow to sizes that fit them for commercial purposes, and aspen and balsam poplar are abundant. At Northwest River, and also at the mouths of the Kenamou and Hamilton rivers, good crops of potatoes and other garden vegetables are grown annually, and it is said that oats will readily ripen also. At and below the narrows, the cold arctic current, which passes down the coast, so lowers the general summer temperature, that potatoes cannot be profitably grown, and garden crops are confined to turnips, radishes and lettuce.

Hamilton Inlet is the present southern limit of the Eskimo on the Atlantic coast. There is now a little tribe of some half dozen families living in log houses on the shore of a cove called Carawalla at the head of Henrietta Island. A few more families are scattered along the shores of the lower half of the inlet. They are in a state of semi-civilization, having adopted European dress, and all talk more or less English. They are poor and dependent on the fishery and seal hunt for a livelihood. The Hudson's Bay Company have two establishments on Hamilton Inlet; the larger, called Rigolet, is situated on the north shore at the narrows, about three miles above the entrance to Double Mer. This is the head-quarters of the Labrador Coast, or Esquimaux Bay district, the officer in charge having under his care the posts of Cartwright on Sandwich Bay, of Northwest River at the mouth of that stream, as well as those of Davis Inlet, and of Nachvak, both situated on the coast to the northward.

Trees.

Crops.

Eskimo.

Hudson's Bay
Company
posts.

Trade.

The post at Rigolet consists of about a dozen houses and stores, and trade for fur and fish is carried on with the Eskimo and "planters." The trade of the post at Northwest River is made with the "planters" living about the upper part of the inlet, and with the Indians, who hunt in the country drained by the Hamilton and Northwest rivers, as well as with those hunting to the southward in the Mealy Mountains.

Missionaries.

A Roman Catholic chapel was erected some years ago near this post, and a missionary priest from the St. Lawrence used annually to visit the Indians there, during the summer. These visits, it is understood, are no longer to be made, the Indians being advised to go instead to Mingan, or other posts on the St. Lawrence, to meet the missionaries. All the Indians of the region profess Christianity, and are very careful to keep all the observances of the church, even when far inland, but their beliefs seem to be inextricably mixed up with their older pagan ideas, and often their views on subjects of religion are very curious.

Indians.

The Indians frequenting Northwest River post are probably the most miserable and ill-conditioned in Labrador. Being deer hunters, and consequently depending largely on the caribou, both for food and clothing, they have little inclination to trap fur-bearing animals and thus improve their condition by trade. As their wants are mainly confined to tea, tobacco, powder and shot, and some few articles of clothing, a small amount of hunting only is necessary to provide their price, and beyond this, except for the labour of following the deer, or fishing, they do nothing, spending much of their time lounging about their tents. They will not work, even when offered very high pay, and when asked so to do, simply laugh and say they are not hungry. They are so improvident that they never lay in a stock of fish in the autumn, as the Indians to the westward do, and when during the winter, from some cause or other, they fail to find the caribou, they are soon reduced to starvation, and many die.

These Indians belong in part to both the Montagnais and Nascauppee tribes. The former tribe hunts between Hamilton Inlet and the Gulf of St. Lawrence, the latter to the west and north-west of Hamilton Inlet. No great physical difference can be observed between these tribes; if there is any, the Nascauppees appear to be slightly taller and less robustly built than the Montagnais. They talk different dialects of the Cree language, but the difference is so slight, that they converse freely together, and understand one another quite readily. The name Nascauppee in the Montagnais dialect signifies "the ignorant ones" and is given on account of their lack of knowledge in regard to the works and ways of civilization, owing to their want of communication with the outside world.

Hamilton River.

The Hamilton River is the most important stream of the eastern watershed of the Labrador Peninsula. Its drainage-basin embraces a wide area of the country extending from the head of Hamilton Inlet westward to longitude 68°, or nearly half way across the peninsula. To the northward its tributaries interlock with those of the Northwest River which also flows into Hamilton Inlet, and with the headwaters of the George River and branches of the Koksoak River that empty into Ungava Bay. The southern limit of its large tributaries is very irregular, and may be roughly taken to be near the fifty-second parallel of latitude, where the watershed separating them from streams flowing southward into the St. Lawrence, is extremely sinuous and almost impossible to trace or define.

Drainage-basin of Hamilton River.

Westward of the Hamilton basin, the general slope of the country is northward, and the drainage is in that direction from about latitude 52°, the water reaching the ocean by the Koksoak River, which drains a considerable area of the central interior between the head of the Hamilton River and the Big River flowing into Hudson Bay.

Owing to the great difference in physical character between its upper and lower portions, the Hamilton River is naturally divided into two parts at the Grand Falls some 250 miles above its mouth. The lower part occupies a distinct valley, cut out of Archean rocks, with the present river-level from 500 to 800 feet below the general level of the surrounding country. The valley varies in width from 100 yards to more than two miles, and the river flows down it, between banks of drift, with a strong current broken by rapids in several places, especially along the upper stretches, but only in one place does it fall over an obstruction of rock.

Division of river into upper and lower.

This valley is well wooded where unburnt, and the timber is all of fair size and of commercial value, in marked contrast to the small stunted trees found partly covering the rolling country of the table-land, on either side of the valley. The river flows into the head of Hamilton Inlet, on the south side, and a long point of drift material, principally sand, projects out into the bay, separating the river from the head of Goose Bay, which extends several miles west of the mouth of the river on its north side. This point is evidently formed from material transported from the valley above and deposited in the quiet waters at the head of the inlet.

The river-valley.

From the mouth of the river to the first fall, the distance is twenty-seven miles, and the direction is S. 80° W. At its mouth, the river is

three-quarters of a mile wide, and shortly above widens out to nearly a mile and a half, for ten miles; then a number of flat, sandy shoals bare at low stages of the water, divide it into numerous channels. Man-of-war Island lies on the north side five miles up stream; it is low and about a mile long, and has a few trees growing on it.

Traverspine
River.

On the south side, a mile and a half above the mouth, a channel enters from Mud Lake, a shallow body of water two miles long, extending to the foot of the mountains and separated from the river by two low, wooded islands. About two miles above Man-of-war Island, on the south side, a small stream, called Traverspine River flows in; it rises in the mountains to the southward. Where this stream discharges into the river, there is a small Indian trading establishment, and the proprietor, Jos. Michelin, has made a little clearing about the place, where he grows an abundant crop of potatoes.

Muskrat
Island.

Muskrat Fall.

Three miles and a half above Traverspine, another small stream, called Caroline Brook, comes in from the south. Opposite its entrance, the river narrows to a mile, and its channel continues with this width twelve miles to Muskrat Island, which is low and well-wooded, and a mile and a half long. On the south shore, opposite this island, there is a little clearing with the winter habitation of Thomas Hope, the last permanent residence on the river. For three miles above Muskrat Island, the river narrows to less than a third of a mile, with a narrow island obstructing the channel in the upper mile. Above this narrow, the channel widens out into a nearly circular basin about two miles across, into the west side of which the river pours with a chute of twenty feet called Muskrat Fall. Above this chute is a heavy rapid 400 yards long, with a chute of twenty-five feet at its head, the total fall being seventy feet. At the chutes, where it rushes over ledges of gneiss, the river is only about 100 yards wide. Immediately on the north side of the falls, there is a rounded, rocky hill rising 250 feet above the level of the valley. On the north side of this hill is a wide plain of fine till. Where the edge of the plain has been cut away to form the basin below the chute, a wide section of over 100 feet of fine till is exposed, without any sign of rock in place. The present channel at the falls is of recent origin, and it is probable that previous to the glacial period, the river-channel was filled up with drift material, so that when the river again resumed its course, it was diverted from its old channel by the obstruction, and passed to the south of the hill where the drift deposit was less thick. Having once cut to the rock surface, well below the upper level of the drift on the opposite side, it has continued in its present channel ever since.

At its mouth, the banks of the river are low and sandy, and have scarped faces from ten to thirty feet high, increasing slowly in height as the river is ascended. Terraces are seen to the south, flanking the mountains up to 300 feet above sea-level. Above Traverspine the banks rise from sixty to one hundred feet and are cut out of coarse, yellowish, stratified sands.

Character of
river-valley
below Musk-
rat Fall.

The western extension of the Mealy Mountains forms the southern wall of the valley, and, above the head of the low point separating the river from Goose Bay, rocky hills are seen also on the north side. The valley, as far as the first fall, varies in width from two to five miles, and the river passes close to the foot of the rocky hills on the south side fifteen miles above its outlet. As the valley has been partly filled with drift, out of which the present channel is cut, it is only when the river accidentally passes close to the rocky walls of the valley, that any rock-exposures are seen. The hills on both sides rise from 400 to 600 feet above the river-level, and partly represent the general height of the surrounding plateau, which rises somewhat higher back from the valley on both sides. These hills are wooded to their summits, but as the upper level is approached, the trees become small and stunted, and only a very few species grow on the table-land above. Black spruce forms over ninety per cent of the wood, the remainder being made up of larch, white birch and balsam fir.

In the valley, on the contrary, the growth of timber is very good, considering the position. White spruce trees two feet in diameter and more than seventy feet high are not uncommon, and a large number of ship spars have been taken out about Traverspine. The black spruce does not grow quite as large as the white, but is still large enough to afford good commercial timber, and the same may be said of the larch growing in the valley. Balsam fir, white birch and both aspen and balsam poplar are here met with and grow to fifteen inches in diameter.

Above the chutes the river soon widens out, and for thirty-five miles flows from the south-west. Its average width for this distance is slightly less than a mile. Fourteen miles above the chutes it narrows to less than a quarter of a mile, and is broken by rapids for two miles above. Below these rapids there is a great sandy shoal, which extends across the course of the river and has forced it to cut a deep bay on the south side out of white sand, that rises in almost perpendicular banks over one hundred feet above the water. This place is called Sandy Banks, and the Hudson's Bay Company formerly maintained a small trading-post on the north side, where the site of their clearing is marked by a new growth of birch.

Above Sandy Banks, the stream is again over a mile wide, with a large island dividing it into two channels, and a deep bay runs off to the north-west from the main channel. Above this island the average breadth is half a mile for five miles, when it again widens to a mile for three miles, to the foot of the Porcupine Rapids. These rapids are nearly three miles long, with a deep channel, the river being about 300 yards wide. There is good tracking along the banks, and no portage is necessary to pass this obstruction.

Gull-island
Lake.

Above the Porcupine Rapids, the river expands again into Gull-island Lake, which is six miles long, and not over a mile wide. The name is a misnomer, as there is a very perceptible current throughout. Gull Island is a small rocky islet on the south side, about two miles from the head of the lake. From the Muskrat Falls to Gull Island the character of the river and valley is very similar to the portion below. The river-channel is wide and shallow, at ordinary stages of the water, and the current is strong, so that tracking is resorted to in ascending with boats. The hills, as far as Gull Island, remain about four miles apart, and there begin to approach, so that the valley is less than half a mile wide at the head of Gull-island Lake. The height of the hills varies from 500 to 800 feet above the level of the river, and much of their surface is burnt over, with less than half of the north side of the valley wooded, with trees similar to those described along the lower stretch.

Terraces.

There are considerable accumulations of drift in the valley, into which the river has cut its present channel. Terraces are common and well marked, especially about the mouths of small streams flowing down from the table-land, on both sides. As many as seven were seen on the south side, below the Porcupine Rapids, the highest being 200 feet up the flank of the mountains. The river-banks are sandy and steep, and vary from twenty to seventy feet, with a margin of nearly level shore at the water's edge, which affords good ground for tracking. Only two exposures of rock were seen along this course. Several small streams fall into the main river on both sides, but none of them is of any size or importance.

Valley above
Gull-island
Lake.

From the head of Gull-island Lake, the course of the valley changes more to the northward and the river flows from N. 70° E. for eight miles; the next course is from S. 60° W. for two miles, and is followed by a stretch of nine miles directly from the south. Along all these three courses, the valley is from a quarter to half a mile wide, with almost perpendicular rocky walls that rise abruptly from the water more than 800 feet, with narrow intervals of drift only in a few places. The river varies from 100 to 400 yards in width, and throughout the dis-

tance is an almost continuous rapid. Up the stream the Gull Rapid is the first, and extends from the lake upwards for five miles. The water is shallow, and the channel is full of rocky reefs and large boulders, over which it tumbles in foaming masses. Owing to the shallow water, this portion of the river blocks in winter with ice, which is piled up in all directions in great disorder and is quite impassable with loaded sleighs, until after sufficient snow has fallen to cover up and smooth out the smaller inequalities. The second rapid is at the bend and is called the Horse-shoe Rapid; it is also shallow and full of huge boulders. Along the upper stretch, the river only in one place exceeds 100 yards in width, where it passes a small island. The channel is rocky and the water is deep, so that, although the current is very strong, the water is not broken, except by a dead swell, until within a mile of the head of the stretch where a heavy rapid makes it necessary to portage.

At the head of this rapid, a large branch called Minipi River, enters the main stream from the south, through a deep, narrow valley, down which it rushes with heavy rapids. This stream discharges a large volume of water from its gathering ground on the table-land to the south and south-west of its mouth. It is said to rise in chains of lakes close to the head-waters of the Natashquan and St. Augustine rivers which flow into the Gulf of St. Lawrence.

Between Gull-island Lake and the Minipi River three-fourths of the timber in the valleys and on the hills of both sides has been burned, much of it by a great fire that raged throughout the summer of 1893. In the green woods remaining, many large spruce trees were seen, from twenty to twenty-four inches in diameter, and sufficiently long to furnish three logs each. A few narrow terraces were seen on the hillsides, but owing to the scanty drift deposits there is not much chance for the development of terraces.

Above the Minipi, the main stream bends sharply, and for twenty-five miles flows from N. 80° W. The valley gradually widens out and to the upper end of the course varies from one to two miles across. Its walls continue to rise from 700 to 900 feet above the water, and are nearly everywhere burnt bare. Terraces again become well marked and numerous, and range from 20 to 250 feet in height. The river channel is cut out of the drift, and the banks rise from ten to one hundred feet above the stream. The river, for five miles above the forks, is never more than 300 yards wide, and then widens to about a quarter of a mile, and is broken by a small shallow rapid where it passes four well-wooded islands, three miles up. Beyond the islands, it narrows again for four miles, and from there to the end of the course

Horse-shoe
Rapid.

River-valley
above the
Minipi.

it passes what is known as the "slack water," where the width varies from 400 to 600 yards in a deep channel with gentle current. There are three large islands along the upper three miles, with another called Cockatoo Island four miles below. Two large brooks come in from the north near the middle of the course; the lower one issues from a deep cut in the hills. On the south side a small river flows in at the upper end above the islands. Both sides of the valley is almost wholly burnt to within a few miles of the upper end, where the north side is well wooded with somewhat smaller trees than those previously met with.

Great area of
burnt land.

The valley now bends to the north-west for five miles, and then northward for ten miles to where a small river flows in from the north-east. Along these courses it does not anywhere exceed one mile from side to side, and the hills are particularly high and rugged on the west side, where they rise from 800 to 1000 feet almost perpendicularly from the water. They are well wooded on both sides to within a short distance of the small river, where the eastern limit of an immense area of burnt country crosses the valley. This area, which extends on both sides of the valley almost to Grand Falls, has been traversed by numerous fires during different years, so that, with the exception of isolated patches here and there, all the original forest has been destroyed, and the sides of the valley and adjoining table-land are either destitute of trees, or partly covered with small second-growth timber of no commercial value.

Câche River.

Along the first or north-west course, the channel is only about 300 yards wide, and is obstructed by a number of small islands of drift. The current is strong, and there is a small river that drops into the valley with a beautiful fall on the west side near the head of the course. Above, the channel widens to a quarter of a mile, and the river is shallow, with small rapids to the upper end of the north course. The stream that here flows in from the north-east, called Câche River, is the largest yet seen on this side, and it has a distinct valley cut down between the rocky hills to a level with that of the main stream. Terraces are not prominently marked along the portion of the river just described.

For the next twelve miles the valley is narrow and very crooked, with sharp bends and a general course north-westward. The rocky walls rise sharply on both sides almost directly from the water, leaving in most places only a narrow margin of steep shore. The hills are nearly all bare and rocky. Terraces are not common, and are best developed at the junction of a small branch from the west about eight miles up, where the terraces are seen rising one above another for 250 feet.

The river varies from 100 to 300 yards across, and is deep and so rapid that in winter ice is formed only along the shores. The Mouni Rapids. Rapids are two miles long and have three heavy pitches at the upper end.

The valley above straightens, and the river flows S. 80° E. from Lake Winokapau six miles above. The stream continues narrow and rapid to the outlet of the lake, and is joined by a small stream five miles below it. Towards the lake the sides of the valley continue to increase in height, until at its outlet bare rocky precipices tower above it 1000 feet or more, with great masses of broken rock piled up at their base. Only a few small trees grow in cracks on the sides and tops, and the general aspect is wild and grand.

Beyond the valley on both sides, the country is covered with broken chains of rounded hills of gneiss that rise from 200 to 500 feet above the general level of the table-land, which is itself over 700 feet above the surface of the lake. The lower lands are either swampy or covered by small irregular lakes that discharge by streams into the valley, where they often fall perpendicularly 500 feet down the rocky walls. During the winter these streams freeze up, and their positions are marked by masses of ice often attached in fantastic forms to the bare surface of the rocks. In other places where the slope is less, the water wells out from below the already formed ice and congeals on its surface, in this manner forming large ice caes.

The table-land is almost denuded by fire, only small patches of trees being left about the lakes and swamps. These consist of a thick growth of stunted black spruce and larch of no commercial value.

Lake Winokapau fills an expansion of the river-valley, and is thirty-four miles long, its general course being N. 80° W., with two slight bends near its middle. For fifteen miles from its outlet it does not exceed a mile in width. Beyond, to its head, the breadth varies from one and a half to two miles.

From its outlet, the north shore, for six miles, has a narrow margin of drift between the water and the rocky hills. Beyond this, and all along the south side, the rocky walls of the valley rise abruptly from the lake, and there is a marked absence of drift both on the hillsides and in the valley.

The water is remarkably deep; an isolated sounding taken fifteen miles up the lake, and about midway across, gave 427 feet, while another taken by Mr. Bryant* gave 407 feet. A third sounding was

Great depth of the lake.

*A journey to the Grand Falls of Labrador, p. 26.

made fifty feet from shore on the south side, opposite the first mentioned, and gave a depth of 80 feet. No other soundings were made, owing to the difficulty experienced in cutting through the ice, which at the time we passed was four feet nine inches thick, and two hours were required to make a hole through it with the implements at hand. Information obtained from Indians shows that the lower three-quarters of the lake are exceedingly deep; the upper quarter has been filled in with drift brought down by the river.

The present bottom of the lake probably nearly represents the level of the river previous to the glacial period, the valley below having been in places filled with drift during that time to levels indicated by the terraces seen along the sides of the valley, rising in places from 200 to 250 feet above the present river-bed. The absence of any rocky ledges in the river-bottom, except at the first falls, where the ancient channel is on the north side of the rocky hill, points to this conclusion. Why the valley should be filled with drift below and above Lake Winokapau, and the portion occupied by the lake should be almost free of it, is a problem in glacial geology to be worked out in the future, but for which there are at present no data.

A small island of drift, covered with willows and a few large white spruce trees, six miles from the head of the lake, marks the beginning of the shallow portion. Above the island there are numerous wide, sandy shoals, bare at low stages of the water, and separated from one another by narrow channels. The main channel passes close to the south bank, and two large, low, wooded islands of drift separates it from a smaller shallow channel on the north side. At the head of the lake, a small branch called the Elizabeth River flows in from the west, down a narrow valley, while the main valley bends to the north-west.

Elizabeth
River.

Ancient
Hudson's Bay
post.

On the south side, at the mouth of the Elizabeth River, there is a wide, sandy plain about twenty-five feet above the river, and on it the Hudson's Bay Company formerly had a post, which was abandoned in 1873, and subsequently destroyed by fire. A small river flows into the lake from the south opposite the lowest island, and the drift on the hillsides is terraced up to 200 feet about its mouth. On the north side, there are three large brooks with deeply cut valleys, and one on the south side; besides these, there are many small streams that fall directly over the precipices, from the table-land above, breaking the monotony of the rocky walls, and adding greatly to the beauty of the scenery.

Character of
surrounding
country.

The hills that bound the valley on its south side are remarkably regular in outline and have been rounded and scratched by glacier ice.

Those on the north side often rise in perpendicular cliffs from the lake; their faces and tops are angular and rugged, and do not appear to have been glaciated. The walls on both sides are from 700 to 1000 feet high, gradually lowering towards the head of the lake, where the slopes are less abrupt and the hills more rounded. At the head of the lake, the general level of the table-land on the south side is 950 feet above it. The country on top is nearly level, and covered with small lakes. Ten or fifteen miles to the south, a conical hill rises about 500 feet above the table-land. On the north side after an abrupt rise of 400 or 500 feet, the land slopes gradually, and does not attain the elevation of the south side for several miles back from the valley. Only a few small scattered clumps of trees remain of the original forest in the lake-valley; these show that at one time the shores and sloping hillsides were thickly covered with large trees of white and black spruce, up to thirty inches in diameter. At present most of the hills are bare, or covered only with small second-growth spruce and birch. The table-land to the southward is quite bare of trees, only the blackened stumps of the former forest remaining. On the north side, bare patches alternate with scattered second-growth black spruce of small size.

Lake Winokapau is well stocked with fish, the employees of the Fish. Hudson's Bay Company when stationed there, depended to a large extent on fish for food. In the old journals* of the post, the catches of the nets are recorded, and show that fish were taken abundantly, especially in the spring. The catch included carp, whitefish, lake and river trout in the order named. Potatoes and turnips were grown at the post, but not very successfully, as after planting in the spring, everybody left the place, and did not return until September, leaving the crops to grow without cultivation.

From the mouth of the Elizabeth River, the main valley turns N. 40° W., and continues in that direction five miles to the mouth of the Metchin River, a small stream having a deep valley, and used as a canoe route to the north-west interior by the Indians. Along this course the valley is about a mile wide, with the hills more rounded and sloping than below, owing to the great quantities of drift deposited here, through which only the rocky summits protrude. The river is less than half a mile wide, and flows close to the north side to within half a mile of the Metchin, where the deposits brought down by that stream have formed a low plain, and have forced the main stream into a narrow channel close to the south wall. Terraces are common and rise to more than 200 feet above the river.

*Winokapau journals seen at Rigolet.

The course of the valley now changes to N. 70° W., and with a few minor bends, continues in that direction for forty-five miles to the foot of the Bodwain Cañon below the Grand Falls.

Character of
the valley.

The narrow channel continues for a half mile above the mouth of the Metchin River, where it widens out to an average width of 500 yards, with high rocky walls on the south side, and drift-covered slopes on the north side. Six miles further up, there is a sharp bend to the northward for one mile, when the river again resumes its previous course. At this bend, the walls on both sides exceed 800 feet, and those on the west side rise in perpendicular cliffs directly from the river, which is here 400 yards wide. Above the bend, the character of the valley is unchanged for twelve miles, the valley being from half a mile to a mile wide, with high rugged hills, mostly burnt, on both sides. The channel is cut out of the drift, and is more irregular in width than below, being frequently narrowed by projecting points. The current is swift and the water appears to be deep. Seven miles up, a small branch flows in from the northward, in a gorge cut down to the level of the main valley.

Portage
River.

After two well-wooded sandy islands are passed, another sharp bend of a mile to the northward, opens out into a wider valley entirely filled by the river, where there is little drift on the hillsides or along shore. The river is very shallow and the current swift. This stretch is seven miles long, and at its head the channel narrows to less than 200 yards, owing to the amount of material brought down by the Portage River, which cuts through a cliff and descends into the valley by a fall of nearly 200 feet, that is almost hidden by the huge blocks of rock heaped up at its bottom. Shortly above the Portage River, the main stream again widens out, filling the valley from wall to wall, and varying from half a mile to one mile in width for eight miles. The portage-route of the Grand Falls, leaves the valley on the north side four miles above the mouth of the Portage River.

Opposite this place and above it, the river is silted up with sand brought down by rapids and deposited in the wider, quieter waters. This sand forms wide flats, covered at high stages of the river, and cut by numerous, deep, winding channels. Four miles above the portage, two large, low, densely wooded islands mark the foot of the rapids that extend almost continuously beyond for twelve miles, to the mouth of the cañon. The channel above the islands soon narrows, and the drift deposits thin out, finally almost wholly disappearing from the sides of the valley, which contracts to less than 300 yards in width and becomes crooked. Three miles above the upper island, the first rocky ledge since

leaving the Muskrat Fall, is seen in the river bottom. Here, there is a heavy rapid which continues half a mile to a short bend to the westward. At the foot of the rapid, Messrs. Cole and Cary, of the Bodwain College Expedition, had the misfortune to burn their boat and supplies, and on this account it has been called Disaster Rapid. The charred remains of the boat was found close to the shore in a small patch of burnt woods.

Disaster
Rapid.

Two miles above this rapid, at the angle of a small sharp bend, a large branch flows in from the west in a well defined valley. Inquiries made among the Indians who had hunted about here, failed to yield any information concerning this stream, and they were surprised to hear of its existence, as they all were without knowledge of any large stream between the main river and the Elizabeth River, which enters Lake Winokapau. The only explanation given about this unknown stream, was that it must be a deep channel of the Valley River, and must leave that stream some distance above the main forks; but the origin and existence of two deep, well defined valleys such as these, forming an island, is anomalous, and could only be accounted for by the river splitting into two branches before it leaves the table-land.

Unknown
channels.

Above the junction of this stream, two sharp bends of the narrow main valley lead, after three miles, to a long straight stretch, where the valley widens somewhat, and patches of terraced drift are seen high up its rocky walls. At the upper end of the last bend, a small stream comes in from the north, descending in a succession of beautiful cascades from the table-land 700 feet above. This stream drains a number of lakes, and when the river is swollen by the spring freshets, a small portion of it passes up a narrow bay above the Grand Falls, and from there by a rocky channel into the small lakes, of which the discharge is thus much increased during the early spring.

For five miles above the junction of this stream, the valley continues straight and narrow, with sandy terraces flanking the rocky walls at intervals along both sides. The river varies from fifty to one hundred yards in width, and rushes along in a continuous heavy rapid, from where the main body of water enters the valley by Bodwain Cañon.

Above the mouth of this cañon the main valley continues in the same direction upwards of ten miles, and then bends slightly northward, its further extension being concealed by the high walls on the north side. As far as seen from the cañon, the valley appears to be from a quarter to half a mile wide, and is partly filled with terraced drift, with a branch flowing with a moderate current down it. This branch has less than a quarter of the volume of the other river, and rises in Lake

Main valley
above Bod-
wain Cañon.

Descent of the river near the Grand Falls.

Volume of water at Grand Falls.

Ossokmanuan on the table-land, thirty miles to the westward. This lake also discharges by another outlet into the main Hamilton River, described later. Eight miles in a straight line north-north-west of the mouth of the cañon, the main branch of the Hamilton River issues from a small lake-expansion, almost on a level with the surrounding surface of the table-land, and begins one of the greatest and wildest descents of any river in eastern America. A large number of barometric readings taken in the vicinity, in conjunction with regular readings at the Hudson's Bay Company's post, at Northwest River, give the height of the river as it issues from the lake as 1660 feet above sea-level. The height of the valley at the mouth of the gorge, determined in the same manner, is very close to 900 feet above sea-level. Consequently, in twelve miles, the total fall is 760 feet. Such a fall would be nothing extraordinary for a small stream, in a mountainous country, but is phenomenal in a great river like the Hamilton, which has been estimated to discharge at this point about 50,000 cubic feet per second, or nearly the mean volume of the Ottawa River, at Ottawa, that stream having a mean volume of 85,000 cubic feet per second at Grenville,* where it includes the waters of the Rideau, Gatineau and Lièvre rivers. The descent includes a sheer fall of 302 feet, the rest being in the form of heavy rapids.

The outlet of the lake is dotted over with small rocky islands, capped with dense thickets of small evergreens. These islands extend downward for a mile and divide the river into a number of narrow channels with a swift current. The stream, flowing southward, then narrows to less than 400 yards, and in the next mile passes over a number of rocky ledges between low wooded banks, falling fifty feet in a continuous heavy rapid. Again it widens out to nearly a mile, and for two miles is obstructed by many small islands, flowing swiftly between them, with short broken rapids. Next, turning south-east, it contracts to less than half its previous width, and rushes along with heavy rapids, in a shallow channel full of huge boulders, with low rocky shores, capped with thin deposit of coarse gravel and sand, and wooded above with small spruce and larch. In this manner the river continues for three miles, gradually narrowing as it descends, with a fall of forty-five feet along the last two courses. The banks and bottom of the river are wholly formed of rock, and as the stream in the next mile has cut a narrow and gradually deepening trough out of the solid rock, at the lower end of the course it flows in a narrow gorge, with sloping rocky walls 110 feet below the level of its upper end. As it descends

*General Report Public Works, Canada, 1867-1882, p. 840.

its width decreases from 150 to 50 yards, and it hurries along with tremendous rapids.

The last 300 yards are down a very steep grade, where the confined Grand Falls. waters rush in a swirling mass, thrown into enormous, long surging waves, at least twenty feet from crest to hollow, the deafening noise of which completely drowns the heavy boom of the great falls immediately below. After a final great wave, the pent up mass of water is shot down a very steep incline of rock for 100 feet, where it breaks into a mass of foam, and plunges into a circular basin below, the momentum acquired during the first part of the fall being sufficient to carry it well out from the perpendicular wall of rock at the bottom, leaving almost a free passage between the foot of the cliff and the falling water. The total fall from the crest of the incline to the basin below is 302 feet. The Indians believe that the space between the falling water and the rocky wall is occupied by the spirits of two maidens who were accidentally carried over the falls, and who now pass their time in dressing and preparing deer skins. On this account, or more probably because of the feelings of awe inspired by the grandeur of the surroundings and the enormous power displayed in this rush of waters, those who hunt in the vicinity cannot be induced to visit the falls or the cañon below.

The shape and character of this fall resembles closely, though on a gigantic scale that of a small stream flowing down a V-shaped trough, inclined at a high angle, and issuing freely from its lower end. The basin into which the river precipitates itself, is nearly circular and about 200 yards in diameter. It is surrounded on all sides by nearly perpendicular rocky walls 500 feet high, except at the narrow cut at the head of the falls, and where the river issues from the basin. The surface of the basin is violently agitated by the rush of water from above, and its huge lumpy waves break high up the rocky walls. The falls are best seen from the top of the south wall, directly opposite, but the dense columns of vapour that rise out of the basin often interfere with the view, and give a blurred, fogged appearance to photographs taken from that side. The noise of the fall has a stunning effect, and, although deadened because of its inclosed situation, can be heard for more than ten miles away, as a deep, booming sound. The cloud of mist is also visible from any eminence within a radius of twenty miles.

The river leaves the basin by a narrow cañon at right-angles to the falls. It flows eastward about a third of a mile, and then bends sharply to the south-west for a half mile, next to the east for a like distance, followed by another south-west bend of similar length.

Character of the falls.

Bodwin Cañon.

In this manner it zigzags until it finally ends in the main valley of the river.

From the falls to the mouth of the cañon the distance in a straight line is not above four miles, but by the river it is over twice as far. This cañon is cut down into solid gneiss, granite and gabbro. Its zigzag course conforms with the direction of two sets of fracture, or cleavage-planes in the rocks, which appear to have caused lines of weakness and aided the eroding action of the water. Except on the inner sides of the bend, where there is a sloping wall of boulders, the walls are nearly perpendicular. At the top, the width rarely exceeds one hundred yards; while at the bottom the river is seldom over one hundred feet wide, and often measures less than half that width. The fall of the river from the basin to the mouth of the cañon is 260 feet, and, as this is accomplished without any heavy drops, the magnitude and grandeur of the rush of water at the bottom of the gorge may be imagined.

The cañon is cut sharply into the surface of the table-land without any appreciable dip of the ground towards it, and there is so little indication of its presence from above, that the gorge is seen only within a few yards of its edge; and its walls are so steep, and the bushes along the top so thick, that in most places it is necessary to hold on to an overhanging tree and lean far out in order to see the narrow white line of broken foaming water that rushes along 500 feet below. As the country slopes gently towards the main valley, the cañon does not deepen with the descent of the river in it, and the walls are everywhere from 500 to 600 feet high, varying with the undulating surface of the table-land.

Origin of
Rodwain
Cañon.

There is little doubt that the cañon is a valley of erosion in an unfinished state of formation, and probably previous to the glacial period was the valley of a much smaller stream than the one at present flowing through it. At that time the main stream in all likelihood followed the main valley. There is no evidence that the valley has been cut back, or otherwise eroded since the close of the glacial period, beyond the removal of the drift, which then filled it nearly to the top, as patches of drift still remain on the inner sides of the sharp bends. From the above facts some idea can be had of the great length of time required for the erosion of the main valley of the river, from the falls to the mouth of Hamilton Inlet, which is really a submerged portion of this river-valley.

John McLean. John McLean, of the Hudson's Bay Company, as before stated, was the first white man to see the fall. In 1839, while on a journey over-

land from Ungava Bay to Hamilton Inlet, he descended the Hamilton River, visiting the fall in passing, and he has given a short description of it in his book.* The falls are known to the Indians and inhabitants of the Labrador coast as the Grand Falls, but as a recognition of the discoverer, as well as the indefinite character of the above name, it is now proposed to call them the Grand or McLean Falls.

The cañon below the falls was first discovered and partly traced by Messrs. Cary and Cole in the summer of 1891, and was named by them Bodwoin Cañon. Messrs. Bryant and Kenason also visited the fall in 1891, arriving there a few days later than the first party. Among others of the Hudson's Bay Company officers who have seen the fall, may be mentioned a Mr. McPherson, who visited them shortly after their discovery by McLean, Père Babel, O.M.I., a missionary who spent two or three seasons living with the Indians about the headwaters of the Hamilton River about 1870, has also given the writer a most graphic account of his visit to the fall at that time.

The portage-route past the fall and rapids, leaves the main valley on the north side at the foot of the rapids fifteen miles below the mouth of the cañon. The road rises 700 feet in a quarter of a mile as it ascends the steep wall of the valley by a narrow cut beside a small stream. It then passes over undulating wooded country, rising slowly for two miles, to a small lake that lies north-west of the lower end of the portage. Crossing the eastern end of the lake, the route turns northward and passes over four portages of 1000, 200, 200, 300 yards long respectively, that connect as many small lakes or ponds. The last portage ends near the middle of Island Lake, which is about three miles long and a mile wide, with its longest axis running almost east-and-west. This lake discharges from its east end into another large lake that empties into the Portage River. Crossing to the north side of Island Lake, two short portages, with a small swampy lake between, lead into another lake about two miles and a half long, which also discharges into the Portage River. The route now changes to west-north-west, and continues in that direction until it reaches the lake-expansion of the river above the falls. From the western end of the last lake a mile portage through a swamp leads to a narrow lake one mile long, with another mile portage from its west end into a similar narrow lake. The next portage is slightly shorter, and crosses a small watershed, passing close to the foot of a high hill on the south side called Lookout Mountain; it ends in a long narrow bay at the east end of Lookout Lake, the largest body of water along the route. This lake is followed seven miles, to its western end, where a small river enters. The

Portage-route
past the Grand
Falls.

Lookout
Mountain.

* Twenty-five years in the Hudson's Bay Territory. Vol. II., p. 75.

greatest breadth near the east end is less than two miles. The lake is shallow and dotted with small rocky islands. It discharges by the little river that falls into the main valley five miles below the cañon, and which, as already mentioned, forms a discharge of the main river during periods of high water.

The inlet is followed through a number of lake-expansions for five miles, with three short portages past rapids and a final one of a half mile that leads to the head of a deep bay of the main river.

Country about
Lookout
Mountain.

Lookout Mountain is a long round hill of gabbro, that rises 460 feet above Lookout Lake. Its summit and sides have been burnt over, and from its top a good view of the surrounding country may be obtained. The surface of the table-land is broken by long rocky hills, connected by low ridges of drift, that run west-north-west, or parallel to the direction of the glacial striae. Between the ridges there are wide valleys filled by long irregular lakes or swamps. Southward from the top of Lookout Mountain, the country is seen sloping towards the river-valley, and it is much more broken and rugged than in other directions. One sharp rugged hill rises well above the rest, and is probably the Mount Hyde of the Bodwain Expedition.

The position of the river-valley here is well marked, the country sloping towards it on both sides. Beyond the valley, the country appears to be somewhat higher than on the north side. Ranges of burnt hills are seen stretching away to the south-west, and bounding the horizon in that direction. Westward, the position of the Grand Falls is marked by the column of mist that rises high over it. No other feature marks the presence of the cañon, and gently undulating hills extend as far as can be seen. To the north-west, the country is very similar, and in the distance lake-expansions of the river appear. North and north-eastward, the ridges of hills are seen running in regular lines with a higher range bounding the sky-line about twenty miles away. Where any depression occurs in the ridges, a shining patch of water marks the position of a lake, in the valleys beyond. Looking south-east, or parallel to the ridges, a perfect network of small island-dotted lakes are seen, filling each valley, and separated from one another only by low ridges of drift. In the distance are a number of high rounded hills near the discharge of the Portage River.

Trees.

Over half of the surrounding country has been stripped bare by frequent fires. In the swamps and around the shores of the lakes, where the trees are unburnt, black spruce and larch of small size grow thickly together. On the sides of the hills these trees are more

stunted, and are separated by open glades. Where the hillsides have been burnt years ago, they are covered with a tangled mass of willows and alders, while the tops are coated with white moss and semi-arctic shrubs and berries. Only on the banks of the river about the falls were trees large enough for commercial purposes seen. Surrounding the basin, white spruce seventy feet high and two feet in diameter at the base, are common, along with large-sized black spruce, balsam fir and white birch. The moisture from the constant column of spray, as well as the warmth from the open water, may account for the better growth of the trees in the neighbourhood. Along the river banks and on the islands above the falls, the trees are larger, and more varied than about the lakes of the portage-route, fair-sized white and black spruce, balsam fir, larch and white birch growing freely.

Upper Hamilton River.

Above the Grand Falls, the character of the river changes completely; it no longer flows in a distinct valley cut deep into the surrounding country, but nearly on a level with the surface of the table-land, spreading out so as to fill the valleys between the long, low ridges of hills that are arranged in echelon all over the country. The river in passing around the ridges is often broken into several channels by large islands formed by separate ridges, and in other places, where there are wide valleys between the hills, it fills long, shallow lakes, with deep bays, and often studded with islands. The river is now so divided into channels and so diversified with island-covered lakes, that without a guide it is almost impossible to follow its main channel, and much time is lost tracing its course through the lakes, which often have several channels discharging into, as well as out of them. The current instead of flowing regularly, now alternates between short rapids and long lake stretches.

Character of
the upper
Hamilton
River.

The banks are often low, and covered with a dense growth of small willows and alders, that form a wide fringe between the water and the conifers of the higher ground behind. In other places, generally at rapids, the stream has cut a channel into the sandy drift that forms the low ridges on one or both sides. The shores of the lakes are very often low, with an interval of flat land between the water and the hills behind. These low shores and those of the islands are generally thickly strewn with boulders, piled up in ridges by the expansion and drift of the ice in the spring. The general direction of the river from the Grand Falls to Lake Petitsikapau, more than 100 miles above, is

Post-glacial
channels.

nearly west-north-west, or parallel to the direction of the glacial striae, and that of the ridges of drift. All these features give to the upper portion of the river an aspect of newness, and indicate that its present course and conditions have been determined by the post-glacial configuration of the table-land, in marked contrast to the ancient appearance of the deep, rock-walled valley of erosion below the cañon in which the river must have flowed for ages, slowly abrading the hard gneisses and granites and carrying away the results of atmospheric decay brought down from its sides by the rains and small tributary streams.

Jacopie Lake.

The first expansion of the river above the portage is called Jacopie Lake. It is seven miles long and about two wide, with two deep bays on the east side, and is surrounded by low, rounded, rocky hills, totally burnt over on the east side, and partly so on the west. A chain of low islands of drift extends along the east side, and almost closes off the bays from the main body of the lake. In a few places, bosses of rock are seen rising from beneath the drift of the islands. At the head of the lake, the current is quite strong in the main channel, with a heavy rapid at the inlet, in order to avoid which, when the water is high, a small channel behind a long narrow island is followed by canoes. There are two short portages here past small chutes.

Flour Lake.

Above the lake, is a stretch of eight miles where the river flows swiftly and is broken by two heavy shallow rapids filled with large boulders. The banks are generally low, and are cut out of drift, the channel averaging half a mile across. Numerous islands divide the stream into different channels, especially towards the upper end, where the river broadens out into the next lake-expansion. This is called Flour Lake, and it is ten miles long and apparently about two miles wide, with deep bays running off on both sides. Its surface is so broken by islands, many of them small and rocky, that it is impossible to determine the shore-line of the lake by passing up its middle. There is distinct evidence of current everywhere, and this grows stronger as the head of the expansion is approached. At the upper end the river splits into two nearly equal channels, that do not again join until Sandgirt Lake is reached, fifteen miles above. The north channel is very rapid, and soon leads into Lobstick Lake, a large and long body of water on the route to Lake Michikamau, described in the part of the report referring to that lake. From Lobstick Lake, a stretch of five miles of river leads into Sandgirt Lake, where the streams again unite.

Channel from
Lobstick
Lake.

The south channel, leading out of Flour Lake, is the ordinary canoe route. The distance by this channel between Flour and Sandgirt lakes is fifteen miles. The stream varies from 100 yards to over a

mile in width, and is obstructed by numerous islands. The surrounding country is low and rolling, with long ridges of drift and little rock. The trees are small and are principally black spruce and larch, with white spruce and balsam fir along shore, and white birch on the hill-sides. The current is always strong, and it is broken by seven short heavy rapids, where the stream narrows and is obstructed by islands. The river-bed at these rapids is composed of large, rounded boulders.

Five miles above Flour Lake, the south channel again divides, and the canoe route continues to follow the southern branch, which flows out of a deep bay in the south-east corner of Sandgirt Lake, the other channel flowing out of the next bay a few miles to the northward.

Lake Kanikauwinikau or Sandgirt Lake, is an irregular-shaped, shallow body of water, with many islands of drift and with sandy or boulder-strewn shores. It is twelve miles long from the southern outlet to the mouth of the Ashuanipi Branch, on its north-west side, where two deep bays continue on several miles farther to the westward, one on each side of the river, and divided from it by wide low points of drift. From the mouth of the Attikonak Branch, on the south-west side, to the northern outlet, the distance is eight miles. Besides the two bays on the west side already mentioned, there are two others, one to the south and the other to the north; these are only a few miles deep, with small streams flowing in at their heads from wide-spreading series of lakes. The country surrounding the lake is somewhat higher than that along the river below, especially on its south side, where a ridge of rocky hills extends from the east to the shores of the Attikonak Branch. Some twenty miles westward, a wide range of hills is seen rising with barren sides over 800 feet above the general level, and it continues in a north-western direction. The outlines of these hills are sharp and rugged, quite unlike those of the hills of the Archean area already passed through. Only their lower slopes are wooded, and in the month of August large masses of ice and snow remained in protected gullies on their northern slopes. The name of Ice Mountains was given to these hills. To the north-west, rounded hills from 200 to 500 feet high are seen, separated by wide valleys containing the bays on that side of the lake. To the north and north-east, the country is undulating and lower, with higher, rounded ridges bounding the horizon. To the east, only low ridges of drift break the general level.

Sandgirt Lake is an important gathering place for the Indians of the interior, on account of the number of routes that centre here. The Hamilton River divides into two branches, the larger or Ashuanipi Branch flowing in from the north-west and the Attikonak Branch

Sandgirt
Lake.

Gathering
place of
Indians.

from the south. The main route from the Hamilton River to Lake Michikamau also ends here. The Indians who trade on the lower St. Lawrence and hunt anywhere in this vicinity, always congregate here in the spring, and descend to the coast in company, either by the Romaine or Moisie River.

Returning in the autumn, they travel together to this lake, where they separate into small parties for their winter hunts. The standing poles of their wigwams, scattered everywhere along the shores and on the islands of the lake, show that several families camp here.

On account of its favourable situation, a *câche* was made on an island in the lake, to store the surplus provisions and outfit, and from here, with lightened canoes, the Ashuanipi Branch was first explored, after which a trip was made to and around Lake Michikamau, before Sandgirt Lake was finally left by the Attikonak Branch.

Ashuanipi Branch.

Ashuanipi
River.

The Ashuanipi Branch, as before stated, flows into the lake on its west side. Its course for thirty miles above, to Birch Lake, is nearly north-west. For five miles above Sandgirt Lake, the river flows through a flat, well-wooded country, and then passes close along the southern base of a sharp, rocky hill 300 feet high. This has been burnt over, giving an unobstructed view from its summit. The bay of the lake to the northward comes close to the base of the hill, and extends some miles westward of it, where the continuation of the valley is filled with a large treeless swamp. South-west of the river, a network of large lakes occupies over half of the area between the river and the Ice Mountains, some ten miles distant. From this hill to a small lake-expansion four miles above, the river varies from 100 to 500 yards in width, with sandy banks from ten to sixty feet high, cut out of the roughly parallel ridges of indistinctly stratified drift, between which it flows with a swift current. The lake-expansion is about two miles wide and over three miles long; it is quite shallow, with low, willow-clad banks.

Ice Moun-
tains.

Increase in
size of trees.

A stretch of five miles of swift water, terminating above in a short rapid, separates the last from the next lake-expansion. A number of high islands of drift obstruct the channel, and the banks are again high and irregular. Occasional white spruce trees are met with along the river bottom, up to fifteen inches in diameter, along with small black spruce, larch, balsam fir, white birch, and a few clumps of small balsam poplar.

The next lake-expansion is eight miles long; its lower half is crowded with low islands, covered with willows; the shores are also low, with a wide fringe of willows and alders between the water and the trees behind. There is a long ridge on the north side, culminating in a rocky hill 300 feet high at its west end.

The increase in the size of the trees about this lake is very marked, and is probably due to the change in quality of the soil, caused by the disintegration of the Cambrian rocks, which here underlie the surface deposits and form a very large percentage of the drift.

White spruce thirty inches in diameter at the base and forty feet high is not uncommon along the shores, black spruce is often twenty-four inches in diameter at the base, but rapidly lessens above, so that few exceed eighteen inches six feet from the ground. Balsam fir is abundant, but not very large. White birch is also common, and grows up to ten or twelve inches in diameter, but is generally crooked and does not afford good bark for canoe-building. Small clumps of balsam poplar are met with frequently with trees six inches in diameter, but crooked and straggling like the birch.

At the head of the lake-expansion, an island seven miles long divides the river into two channels, with the greater part of river flowing in the northern one. The island is formed by a high ridge of drift into which the river has cut deeply in many places, giving sections of from twenty to sixty feet, and showing that the material is almost wholly sand, with evidence of bedding. In places the banks are cut into small terraces up to a height of sixty feet, in one place to the number of eight.

The north channel varies from 200 to 300 yards in width, is dotted with small islands of drift, and has a swift current with strong eddies behind sharp boulder-strewn points. All these eddies swarm with large brook trout from three to six pounds in weight. Five miles up, the channel widens out and is split by a number of large low islands as Birch Lake is entered.

Birch Lake.

The shape and size of this lake are well seen from the summit of a sharp rocky ridge that extends for two miles along its south side near its western end. This ridge is very similar to others that now run south-east and north-west, parallel to one another, with wide valleys between them. The hill consists of stratified Cambrian rocks, highly tilted, and has cliff-faces on both sides with intervals covered with drift resting on the steep slopes. The summit of the ridge is irregular and narrow, so that almost anywhere the foot of the hill can be seen on both sides from the top. The sides, where unburnt, are covered with large white spruce in open glades to within a hundred feet

Character of
country about
Birch Lake.

of the top, where they give place to a thick tangle of willows and alders. On the top the willows are smaller, less matted, and do not interfere greatly with travel. The higher points are only covered with small shrubs, including the cranberry (*Vaccinium Vitis-Idea*) that grows in great profusion. The highest point of the ridge is about 350 feet above the water.

Birch Lake is ten miles long from the northern outlet to the mouth of its southern inlet, and is less than five miles across in its widest part. Long ridges of drift form deep bays at both ends. The large island already referred to divides the eastern end into two bays, while a long string of islands separates off another portion of the lake on the north. The western end is also deeply indented by three narrow bays that develop into channels of the river at their heads, and thus form two large islands that extend to the next lake to the north-west.

Cambrian
ridges.

The north side of Birch Lake is bounded by a sharp ridge extending the whole length of that side. Its height varies from 300 to 400 feet; its top and the greater part of its south side are treeless, the lower parts having been burnt over many years ago, and the conifers have since given place to willows and alders. Fires have devastated much of the country surrounding the lake, and, as the trees once destroyed appear to grow again very slowly, large areas have a barren, desolate appearance; they are covered with small bushes and shrubs, and in many places only with white reindeer moss. This moss, or rather lichen, covers the ground everywhere, even in the thickest woods, and, except in wet weather, is much more agreeable under foot than the tangled masses of *Kalmia* and Labrador tea met with throughout the country to the southward. On the islands and shores where the forest is unburnt the trees are very similar in size to those last described. To the south of the ridge there is a wide valley stretching far away to the south and south-west, broken only by low ridges of drift and streaked everywhere with water—parts of large irregular lakes—the view from the ridge giving an impression that over one half of the surface in those directions is covered with water.

The southern inlet of Birch Lake appears to be the largest; it varies from 100 yards to nearly a mile in width, and is greatly obstructed by low, sandy islands, with shale beneath. The channels are shallow, and the current strong, with several small rapids, especially along the upper part, the last a heavy one 200 yards long, where the river flows out of Dyke Lake. There are twelve miles of river between the lakes, and several small streams enter by deep bays on both sides. At the foot of the upper rapid two channels separated by two long islands join as the river issues from Dyke Lake.

The shores along the river are low and well wooded, and the general flatness of the surrounding country is broken by a few short rocky ridges of irregular outline on both sides.

Entering Dyke Lake by the right-hand channel, a bay about one Dyke Lake mile wide and four miles long is ascended to the end of the large island that extends from Birch Lake. The bay is walled in between steep rocky ridges that rise from 300 to 500 feet above the surface. The ridge on the north side terminates abruptly in a sharp pointed hill 490 feet high and cut transversely to the ridge by a great fault, and on this account called Fault Hill. The southern ridge is wooded, the northern one is mostly burnt. The lower flanks of Fault Hill are covered with groves of white and black spruce for 300 feet up; above this, only willows and alders grow to near the summit, where moss alone partly covers the surface. The trees, as the river is ascended, again become small, and, although large white spruce trees are met with on the lower flanks of the hills, they are stunted in height, and thick branches grow close to the ground, forming great knots in the trunk and rendering the wood practically valueless. Poplar is not seen above Birch Lake.

The only way in which an idea of the extent and shape of these Country about Fault Hill. irregular lakes along the river can be obtained, is by climbing the hills. For this reason Fault Hill was ascended, and from its summit Dyke Lake was seen stretching away far to the north-west. The southern channel extends into a deep bay behind two large islands on the south side. These islands are separated by a narrow channel a short distance above Fault Hill, and from there the upper island continues five miles with a channel nearly half a mile wide, dividing it from a point of the mainland. Looking backwards, the two northern channels, as well as the one ascended, can be traced to Birch Lake. They are all dotted with islands, and the darker water in several places indicates short stretches of rapids.

The bay on the north side of Fault Hill, is much deeper and wider than that on the south side, and extends seven miles eastward. Its surface is covered with numerous islands, very irregular in shape, and apparently representing ridges of drift, the lower portions of which are submerged. Abreast of Fault Hill, the lake is nearly twelve miles wide, but no idea of its size can be obtained on its surface owing to the number of islands. Westward, the lake gradually narrows, and two large islands almost separate the northern side from the main body. Eight miles further up, the large islands terminate, and the lake narrows to about two miles.

The country about this lake is much rougher than any previously passed through and the north side of the lake is bounded by a continuous ridge that rises from 300 to 500 feet. The larger islands are high and rocky, and consists of broken ridges. Along the south shore, there is an interval of low land extending to within a short distance west of Fault Hill, where a wide ridge commences and extends westward several miles. This is probably one of the highest points in this region; the main hill rises far above the surrounding ridges and the upper half appears quite barren.

Entrance to
Lake Petitsikapau.

The lower land to the south is covered with large lakes, and the horizon is bounded by a long, unbroken ridge. From the narrows the lake continues north-west for nine miles to the head of the north bay, where a short, deep, rocky narrow about two hundred yards wide divides it from Lake Petitsikapau. A high rocky ridge bounds the north side of the lake along this part, with an interval of swamp between it and the water, terminating in a low muddy shore. The high land on the south side ends about three miles up, and is replaced by a flat swamp, thickly covered with black spruce and larch. The trees, on the slopes of the northern ridge are larger, and many stout, knotted white spruce are seen on the lower flanks more than two feet in diameter at three feet from the ground. The main river enters with a short rapid on the south side near the head of the lake. At the time this place was reached, the water in Lake Petitsikapau was very high, and a large volume was passing through the deep outlet, which was mistaken for the main river. In consequence, a week was spent carefully examining the western and northern shores of that lake, in search of a large river flowing into it.

Lake Petitsikapau.

Lake Petitsikapau (or Willow-fringed Lake) is the largest body of water in this part of the country. It fills a wide, shallow valley between sharp ridges of rocky hills similar to those already described. Minor ridges cut its ends into a number of deep bays and give to it a very irregular outline. Almost everywhere, the shores are low and swampy and bordered with willows. The greatest length is twenty-five miles from south-east to north-west, and its widest part measures eight miles across. The north-west end is divided into four narrow bays, of which the northern one is the longest. To the southward there are only two bays, the most southern of which is from two to three miles wide, and extends south-east over ten miles, with only a narrow neck of land between it and Dyke Lake. The northern end of the lake is covered with numerous low islands of limestone and shale; these islands are generally long and narrow, running parallel to the strike of the rocks. The water between the islands is very shallow, and

in many places difficulty is experienced in finding a passage for light ^{shallow} canoes. The southern portion is comparatively free of islands, and those found there consist of drift and are somewhat higher than those of limestone and shale. The whole lake is very shallow, and in its widest part, where islands are absent, it was found not to exceed ten feet in depth. Small streams flow into the heads of all the northern bays, and from the ridges these are seen to drain chains of small lakes in a wide valley that extends many miles beyond the head of the lake, where the waters of Hamilton River interlock with those of a branch of the Koksoak River flowing into Ungava Bay. The largest stream entering the lake flows through a chain of lakes to the eastward and empties into the north-east bay. A rocky ridge from 200 to 300 feet high and less than a half mile wide, extends along the north shore westward of this stream, and divides Petitsikapau from a deep narrow bay of Lake Attikamagen or Deer-spear Lake, at the head of the George River, which also empties into Ungava Bay. ^{Head-waters of Gorge River.} This bay runs north-west some eight miles, and joins the main body of the lake, which, from the crest of the ridge, is seen stretching away several miles in that direction; it then bends eastward, where it disappears behind a high ridge. A deep cut in the horizon-line to the east shows where the outlet of the lake passes between the hills.

Lake Petitsikapau is on the edge of the barren grounds. The trees still grow in the valleys and on the lower hillsides, but the upper parts of the hills are barren. Northward a succession of high, barren ridges are seen, with an occasional glimpse of a lake, or of a valley wooded with small spruce and larch trees. Total barrens do not occur in Labrador until Ungava Bay is reached, as trees always grow in the river-valleys to the south of it, although the uplands beyond Petitsikapau are covered only with willows and arctic shrubbery.

For many years the Hudson's Bay Company had a post called Fort Nascaupée on the second northern bay of Petitsikapau. This post was established about the time of McLean's journeys from Ungava to Hamilton Inlet, in or about the year 1841, and it is mentioned by W. H. A. Davies in an article published in 1843, as having then been lately established.* This post was erected for trade with the Nascaupée Indians of the interior, and was quite successful until after the second establishment of Fort Chimo in 1866, when the Indians began to desert it; those from the north going to Fort Chimo, while the southern Indians traded at Mingan or Seven Islands, on the Gulf of St. Lawrence, or at Northwest River—all of them preferring to undertake the long

*Trans. Lit. and Hist. Soc. Quebec, vol. IV., part I., p. 74.

arduous journey to and from the coast, where they could obtain better prices for their furs, and purchase provisions and other necessities at a much cheaper rate than at the interior post, where the cost of transport and maintenance added several hundred per cent to the original cost of the goods. The post was accordingly abandoned about 1873, and now the only trading posts of the interior are those situated at Nichicun and Mistassini.

Ruin of the
fort.

The ruins of Fort Nascaupsee stand in a small clearing, close to the shore of the lake, and only a short distance above high-water mark. The houses were built of small, squared logs, with board roofs. When visited, the dwelling-house was in a fair state of repair, with the window sashes and some of the glass still in place. The doors and movables inside had been broken up and used for firewood by Indians; the roof was nearly unbroken, and leaked only in a few places. This building is about twelve by eighteen feet, and has a low room under the attic roof above. Adjoining the main building on each side are two smaller buildings, evidently used for a kitchen and store; the roofs of both have fallen in. Traces about twenty yards to the east of these ruins, probably represent the remains of some outbuilding. About fifty yards behind, the powder-house covered with earth was seen, with broken roof and partly filled up with earth. Adjoining this is a small burying place with a large wooden cross in its centre, but without any marks on the graves, which are probably those of Indians. In the attic a fragment of "The Albion," of March 7th, 1846, was found. Close to the house were several patches of rhubarb eighteen inches high, while a number of introduced plants still flourish in the old door-yard.

River above
Dyke Lake.

As previously stated, the main river flows into Dyke Lake, from the south, close to its north-west end. At its entrance the river is obstructed by a number of small rocky islands and large boulders, between which the stream descends in a heavy, shallow rapid about 300 yards long. The lake above the rapid has the general north-west and south-east trend, and is six miles long and two miles wide at its south end, gradually decreasing to a mile at the other end. Both sides are high and rocky. The river flows into the lake from the south almost opposite the outlet. At the entrance a large dyke crosses the stream, forming a number of islands with heavy rapids between them; above the rapid is a short stretch of swift current, and a large island of drift divides it into two equal channels each about 300 yards wide, where the river falls with shallow rapids for a quarter of a mile from Astray Lake, immediately above.

Astray Lake, so called from our wanderings in search of the river, Astray Lake, follows the general direction of all the lakes of the vicinity, determined by the course of the rocky ridges. From the head of its longest northern bay to where the river leaves it, the distance is twenty-five miles, and the south-eastern bay extends some distance beyond. In its widest part it is about four miles across. Two rocky ridges, forming long narrow points, divide the northern half into three deep narrow bays; the southern end, five miles below the outlet, narrows to less than two miles, and passes close to the foot of Red Mountain, the high hill seen from the top of Fault Hill. Two low ridges of limestone extend down the centre of the wide part of the lake, and form chains of rocky islands. The ridges on the south side of the lake are low and broken, and the shore line on that side shows frequent low cliffs of yellowish-white limestone. Quartz Hill is a sharp hill of white quartzite that rises 300 feet above the lake, on the south side, opposite the outlet. This hill is wooded almost to its summit with white and black spruce trees, but on the summit they do not grow more than six inches high. The trees surrounding the lake are very similar to those seen about Dyke Lake, except that they are somewhat smaller.

A small branch of the river flows into Astray Lake, twenty-four miles from its north end, coming in with a short, shallow rapid from the next lake, called Marble Lake, which is separated from the last only by a narrow ridge of limestone. The other channel of the river flows out of a south bay and joins Astray Lake, a few miles to the east of the first.

Marble Lake stretches north-westward from the outlet, and for four miles is more than three miles wide; it then contracts to about a mile, and becoming shallow, soon shows current, and thus changes into the river. There is a small rapid two miles above, where a ridge of drift-covered islands extends diagonally out from a long point on the north side causing the stream to flow in a narrow channel on the south side. The shores of the lake are low, and often composed of ledges of white limestone. The surrounding country is also low, apparently swampy, and well wooded with a thick growth of small spruce and larch. Marble Lake.

The river above the narrows continues to flow with a strong current from the north-west for six miles, in a shallow channel over half a mile wide, with low swampy shores. Many sandy shoals obstruct the channel, and huge boulders are scattered everywhere.

The course of the stream now changes to south-west, and in the next six miles is broken by heavy rapids, full of large boulders, as it descends from the next lake above. Flowing in this direction, it crosses the

strike of the rock at a right-angle, and the rapids are formed by the river passing over nearly flat beds of limestone. Two miles above the bend, there is a fall of six feet, where the river drops down over the edge of a thick bed of limestone. The channel along this stretch is very irregular in width, and is often split by large islands. The rapids end in a long narrow lake trending north-north-west from its outlet for several miles to where it appears to end against a high range of hills. The west side of this lake is bounded by a continuous range of sharp, barren hills that extends far southward.

Menihuk
Lakes.

The river now nearly doubles on its former course, and passes directly from the south through three long narrow lakes, called the Menihuk Lakes, connected by short river stretches. The lower lake is fifteen miles long from its outlet to its head, and it varies from one to two miles in breadth. The rocky ridge already referred to passes close along the west side, with foot-hills of drift in many places rising directly from the water. The country on the east side is low and swampy, and broken only by small ridges of drift. An invasion of sandy drift forms two long points extending out from the west side of the lake, contracting the channel and causing a wide shallow rapid nearly half a mile long, at the head of the lake. The next lake is twenty-three miles long and its average breadth is slightly greater than the last. The surrounding country is similar to that last described, being flat eastward and having the high, sharp range along the west side. Towards the upper end, the course of the lake and that of the hills diverge slightly, so that at its head the hills are from three to five miles distant, and are lower than to the northward. Twelve miles above the outlet of the lake, a large stream flows through a deep cut in the hills and enters the lake with heavy rapids from the west. Its volume is about equal to one-third of the whole river below.

Middle lake.

The middle lake is separated from the upper by a stretch of river three miles long. The stream is half a mile wide, and the channel is very shallow, with a moderate current. The banks on both sides are formed of drift, and those on the east side are terraced for sixty feet above the present level of the lakes. The upper lake is ten miles long and about two miles wide. It is very shallow and filled with islands of drift, two of which are high, with scarped banks of coarse sand. The range of hills on the west side is now from five to ten miles distant, and appears to be gradually dying away to the southward. In the distance, on the east side, a high range is seen, which is probably the Ice Mountains to the south-west of Sandgirt Lake.

The country on both sides of the lake is higher and more broken than previously noted, the ridges of drift being more pronounced.

This change in the topography is probably due to the change in the underlying rock, the stratified Cambrian beds giving place to Archean schists.

Above the upper lake the character of the river changes completely, and resemble the stretch between Sandgirt and Birch lakes, becoming narrow and rapid, with an irregular channel filled with many small islands of drift, and with irregular sandy banks cut out of ridges of till. Frequent short rapids, full of boulders, connect longer stretches of swift, unbroken water for the next twenty-four miles, to where the exploration ended at a small conical hill close to the east bank. From the summit of this hill looking southward up the valley, the river was seen to expand into a small lake a few miles above, and beyond that to again contract as it winds with short bends, from side to side. From information subsequently obtained from Indians acquainted with the part above, it was learned that it flows out of Ashuanipi Lake some thirty or forty miles south of the farthest point reached, and that its character remains the same to the outlet of that lake, with swifter water in a narrow, irregular channel, studded with many small islands. The region through which it passes is low and broken by rounded hills and ridges of drift that never rise more than 300 feet above the general level.

Character of the country above the Menihek Lakes.

Ashuanipi Lake.

At the end of the survey the river is seventy-five yards wide with an average depth of six feet, and the current is about four miles an hour, giving a discharge of nearly 3000 cubic feet per second.

Lake Ashuanipi, from descriptions given by the Indians, is situated close to the watershed dividing the Hamilton River from the Moisie River. It is upwards of fifty miles long, very irregular in outline, with deep bays, and is partly covered with many islands, some of which are very large. It is not a deep lake, but its water is very clear and well stocked with fish.

The trees along the river and the Menihek Lakes are much smaller than any previously seen. Black spruce forms ninety per cent of the whole, with larch next in abundance, and a few balsam and white birch. Along the lake shores the trees are very stunted, and all bent towards the south by the prevailing northerly winds. The stunted growth of this region is accounted for by the large areas of swamp land along both shores, where deep sphagnum covers the wet ground, which below a depth of eighteen inches from the surface is permanently frozen. The ridge on the west side of the river varies from 300 to 600 feet in height above the water, and is devoid of trees above the level of 200 feet. Much of the lower ground is also treeless, having been

Trees.

burnt over by extensive fires at different periods. After such fires the country is covered only by willows and alders for many years, until the spruce again reproduces itself.

Route to Lake Michikamau.

Having returned from the upper part of the Ashuanipi River to Sandgirt Lake, an exploration was next made from there to and around Lake Michikamau. A description of this portion of the country is introduced here, because the other route leads up the Attikonak Branch to its head, and from there down the Romaine River to the Gulf of St. Lawrence, and it is thought advisable to complete the description of the interior before entering upon that of the southern region.

The route to Michikamau leaves Sandgirt Lake by its northern discharge, which is four miles long, over half a mile wide, and is obstructed with large islands. The channels are shallow with low shores, and the current is strong, terminating in a quarter of a mile of heavy rapids, where the river empties into Lobstick Lake. This is another large body of water, divided into deep bays by long low points and large islands. The surrounding country is nearly flat, and broken only by small rounded hummocks of rock, that seldom rise over 100 feet above the general level. There is also a marked absence of the long parallel ridges of drift, and bare rock shows in almost every elevation, forming the many small islands scattered over the surface of the lakes. There are two deep bays that extend away from the inlet of the lake. One runs directly south-east, with its outlet close to Flour Lake, into which it discharges by the north channel of the river, as has been already mentioned. The other bay runs due east about eighteen miles, and is divided into two portions by two large islands, that extend from the westward of the inlet to within four miles of the head of this bay. There is also a great bay stretching in a north-west direction from the discharge and ending at the foot of a range of rounded hills some twenty-five miles distant, where a small river flows in, which is used by the Indians as a canoe-route to the caribou grounds on the George River, beyond the north end of Lake Michikamau.

The route to Michikamau follows the east bay, passing along the south shore of the large islands. Four miles from the inlet a narrow is passed, where the water between the low, rocky islands and shore is so shallow that only with difficulty a channel can be found for light canoes between the boulders, which thickly cover the bottom. At the

Lobstick
Lake.

narrow, a slight current is apparent flowing toward the west. Beyond the narrow, the route continues up the bay, passing between many rocky islands for ten miles, to another narrow about fifty yards wide, between the second large island and a long rocky point. Here, the current is strong for 200 yards, when the lake again opens out, but is covered with such a multitude of small rocky islands that no idea of its extent can be obtained by passing through it. For ten miles the route now follows the south shore, passing through narrow channels between the islets. A number of long, rocky points form deep, narrow bays along shore, and complicate the navigation, so that even an Indian guide is often at fault as to the right direction to follow. Two short heavy rapids on a small stream lead upwards into another island-covered lake, with even more crooked and narrower channels through which the route passes to a small bay near the eastern end of the lake, five miles from its outlet.

Island-
covered lakes.

A range of rounded hills from 200 to 400 feet high extends along the north and east sides of the lake. At the head of the small bay, there is a gap in the hills about half a mile wide, where at ordinary stages of the water a small stream trickles down from the next lake, a mile beyond, through a series of little rocky pools filled with boulders. When the water is high in Lake Michikamau, which connects with this small lake, a large stream discharges from it through this valley, thus connecting the headwaters of the Hamilton River with those of the Northwest River, which flows out of Lake Michikamau on its north side. A portage of a mile and a half is here ordinarily made. It crosses a rocky hill on the east side of the valley, and then passes over a high drift plain to near its upper end, where it terminates on the wide bouldery shore of the upper lake. This lake is very shallow and full of small rocky islands and points, with its shores and bottom deeply covered with boulders. It lies in a continuation of the valley, between low rocky hills. Two miles eastward, a rocky narrow occurs, where the water runs in and out, the direction of the flow being determined by that of the wind. Beyond the narrow, the lake widens to over two miles and extends a few degrees south of east, for eleven miles. A long low point separates this bay from a similar one on the north side. The south side is bounded by low, rounded, rocky hills, and the surface of the lake is strewn with small rocky islands, with shallow water between them, where large solitary boulders often rise above the surface. The bay on the north side of the long point, heads nearly opposite the portage, where a small stream enters it from the west. Near the mouth of this stream, the Hudson's Bay Company kept a small outpost called Michikamau during the

Watershed
between
Hamilton and
Northwest
rivers.

Hudson's Bay
post.

time that Fort Nascaupsee was occupied. Nothing can be learned about this outpost from the old Hudson's Bay Company journals at Rigolet or Northwest River, beyond the bare facts that a post was maintained there for a number of years, and was finally abandoned from the same reasons which caused Fort Nascaupsee to be given up. This post was not visited, but, from the accounts of the Indians, some of the buildings have been accidentally burnt, and those remaining are in about the same state of decay as Fort Nascaupsee.

From the head of the lake, the route turns south-east for nearly six miles, following down a small river that flows close along the west side of a rocky ridge-flanked with sandy drift. The channel varies from 100 to 200 feet in width, and is bounded on the west side by a long point of sand, broken into narrow islands towards the south. This point and the islands are merely a ridge thrown up by the river, between it and a large lake to the westward.

The next change in direction is to due east, where the river flows first with a strong current between a number of low rocky islands, and then widening gradually passes, for four miles, between high banks of drift into Lake Michikamau. The hills, on the west side of the river are rounded and irregular, varying from 50 to 200 feet, and covered thickly with boulders. The east side is from 50 to 100 feet high and flat on the top, with traces of terraces from thirty to fifty feet above the present level of the lake.

Lake Michikamau.

Lake Michikamau.

Michikamau, or the Great Lake of the Indians, is the largest in eastern Labrador, being second only in size to Lake Mistassini. Its greatest length from south-east to north-west is about eighty miles, and it is twenty-five miles across in its widest part opposite the discharge. The main body of the lake is sixty miles long, with a long, narrow, unexplored bay extending south-east more than twenty miles, from the south-east corner. The widest part of the lake is in the southern third; in the northern part of the middle third, a long point, and a line of large, high islands of eruptive rock, extend far out from the north-east side, and narrow the lake to six miles. Between this point and the north-west end, the average breadth is eight miles. Islands are numerous along the shore and in the southern part of the lake but elsewhere it is unobstructed. In comparison with Lake Mistassini, this is a much finer body of water, and its size appears much greater, owing to the absence of long points, and chains of islands.

Finer scenery than about Mistassini.

d about.
Rigolet
s main-
ed from
This
some of
ing are

nearly
he west
varies
le by a
. This
e river,

er flows
islands,
n banks
of the
et, and
00 feet
fty feet

gest in
i. Its
miles,
he dis-
a long,
miles,
in the
point,
ar out
etween
miles.
of the
e Mis-
much
lands.

VOL. VIII, PART L, PLATE II.

GEOLOGICAL SURVEY OF CANADA.



VIEW OF SOUTH END OF LAKE MICHIKAMAU.
FROM HILL (450 FT.) NEAR OUTLET OF LAKE.

Photo. by A. P. Lee, 1894.

low.]

Lake M
grande
shores c
cold, am
winter,

On a
engaged
from th
The lak
that ca
weeks i
the car

The
Archae
basin i
existed
now fo

The
above
small a
treeless
shores,
clump
From
northw
cession
only in
merabl
North
inlet,
islands
irregul
narrow
the top
on the
lake.
dark-b
also fo
is quit
culmin
high, v

Lake Michikamau is surrounded by rugged hills which add to the grandeur of the scenery, in marked contrast to the low monotonous shores of Mistassini. The water of the lake is remarkably clear and cold, and according to the Indians, who set lines through the ice in winter, the depth is very great.

On account of the heavy sea running during the whole time we were engaged in exploring the lake, it was impossible to make soundings from the small canoes, except behind islands and close to the shore. The lake being free from islands, any moderate wind raises such a sea that canoe travel is frequently impossible, and the Indians are often weeks in passing from the discharges to the north end, on their way to the caribou grounds.

Delays caused
by wind.

The lake occupies a deep basin surrounded by chains of rounded Archaean hills that rise from 200 to 500 feet above its surface. This basin is very ancient, and like that of Lake Mistassini, must have existed previous to the deposition of the Cambrian rocks which are now found lying undisturbed in many places around the lake.

The hills surrounding the lake are wooded for only about 200 feet above the water, their tops being covered with white lichens and small arctic shrubs. The outer islands and exposed points are also treeless, and the trees growing on the more protected islands and shores, are small black spruce and larch, with only an occasional clump of straggling white birch on the lower slopes of the hills. From a high barren hill north of the discharge, the view looking northward beyond the lake is exceedingly desolate, and shows a succession of low rocky ridges extending to the horizon. Trees grow only in small patches in the lake-strewn valleys between, and innumerable huge boulders are scattered indiscriminately everywhere. Northward along the west shore, for seven miles from the inlet, the shores are low and boulder-strewn, with many small low islands of drift strung along in a close fringe. The shore-line is irregular, and small ridges of drift form points behind which long, narrow bays run off westward. Some of the islands are flattened at the top, evidently by the action of water, and there are small terraces on the scarped sides up to thirty-five feet above the present level of the lake. Beyond this the shores become higher, with rounded hills of dark-brown rock rising in small hummocks above the drift, and also forming high rocky islands along shore. The country behind is quite rough, rising in irregular hills, from 50 to 250 feet high, and culminating in a sharp cone called Petiscapiskau, more than 350 feet high, which is visible for many miles along the other shore, and forms

Character of
the surround-
ing country.

Petiscapiskau,
Hill.

an admirable triangulation point. From Petiscapiskau to the north end of the lake, some six miles, the shores are low and sandy, with boulder-covered points. The land slopes gently up from the water to an even ridge of drift-covered granite about 300 feet high that extends north-west far beyond the north end of the lake.

The north shore is low and sandy, with shoal water extending far out from it. Many boulders of red granite are scattered about, both in and out of the water, and are sometimes arranged in rows along the shore, by the expansion of the ice in the spring before the waters rise.

Michikamats
Lake.

A little river enters the north end of the lake, with a small rapid full of large boulders, where the channel is about fifty yards wide and too shallow for canoes. This is the discharge of Michikamats or Little Michikamau Lake, which occupies the northern extension of the valley and is separated from the main body of the lake only by a long, narrow interval of drift. This lake is over twenty-five miles long, and extends north-west to and beyond the north side of a high range of hills which is seen in the distance to divide the main valley. From the north end of Michikamats, three passages connecting narrow lakes lead to a branch of the George River, where the Indians of the region assemble in September to spear the caribou, which then cross the river in immense herds in the course of their annual migration from the high barren grounds behind Nain to the wooded region of the interior, where they pass the winter.

The east shore of Michikamau for twenty miles from the north end, is low, with bouldery points and reefs, and without the fringe of islands. A sharp rocky ridge 300 feet high runs parallel to the shore, and about six miles back from it. The interval between the water and the hills is occupied by small lakes and swamps that lie between low ridges of drift.

Twenty miles up, the highlands come out on the shore of the lake; and from there to the outlet, or for the next thirty miles, the shores are high and rocky, with deep water close in, and only a few small rocky islands along shore. The country behind is exceedingly broken and rough, with bare hills of dark-brown rock, rising in irregular, sharp bosses from 50 to 300 feet above the surface of the lake. Along the lake southward, the gabbro rocks, which form these broken hills, are replaced by granite near the discharge, and then the country becomes more regular, although still very hilly.

Country to the
north of
Michikamau.

From the summit of a barren granite hill 400 feet high, close by, the discharge or Northwest River is seen to leave the lake between

a number of large, flat-topped islands of drift about thirty feet high, that extend outwards from the shore some four miles, and along it for six miles. A long, low point of drift, passing into a ridge, separates the river from the southern part of the lake, and the river is seen extending eastward through a succession of lake-expansions, until it passes behind and is hidden by rocky ridges in that direction. Another chain of lakes extends northward from the river and passes close to the base of a high range on the horizon. By these lakes a second route leads to the caribou grounds, which is used by the Indians when they want to proceed there direct, without the delay usually caused by adverse winds on Michikamau and Michikamats. The river flowing into the Atlantic near Davis Inlet, heads in the high range to the north, and a winter-route from the George River to the coast follows its course closely. Owing to many rapids and falls, entailing several long portages, this stream is never used as a canoe-route by the Indians.

From the discharge to the south-east end of the main body of the lake, some ten miles, the shores are low and sandy, with boulder-^{sheets.} covered points and much swampy land behind. There is a deep narrow bay that extends south-east from this corner, where it passes away between rounded, rocky ridges, running parallel to its course. Its entrance is nearly closed by small, low islands; its upper end was not explored, but it is said to be more than twenty-five miles long, with a small river falling in at its head.

The south end of the lake is shallow and is dotted with many small islands of granite. The shore is very irregular and often rocky, and the country behind is broken by several ridges from 200 to 300 feet high. There is another deep bay on the south side, where a couple of small streams discharge.

The country along the west side is broken by low ridges, with a wide interval of swampy land along the shore. The coast-line is indented by deep bays, between wide swampy points, fringed with boulders. From the south end to within five miles of the inlet, there is a wide fringe of large islands of sandy drift, that rise only a few feet above the water.

Attikonak Branch.

The northern channel of the Attikonak Branch flows into Sandgirt Lake on its south side. It is ascended from the lake in an east-south-east direction three miles, to where it is broken by a heavy rapid nearly a mile long, with the channel about 100 yards wide, choked with

Attikonak
River.

large boulders. A portage of a quarter of a mile, across a boulder-strewn point, ends in a small bay of a lake-expansion above the rapid. From the head of the rapid the river widens to nearly a mile, and for the next three miles flows from south-south-east. Beyond this course the direction changes to north-west, and continues so for five miles, in a narrow, irregular channel, obstructed by numerous islands, and bounded by low, rocky shores in many places, to where a small branch from the base of the Ice Mountains joins the main stream. A chain of small lakes is now entered, connected by short rapids. The general course of the route through these lakes and a larger lake above them is south-south-east; the lower lakes are four miles long, while the large one, called Gabbro Lake, is seven miles from outlet to inlet, with a long bay stretching towards the south-east. Another narrow one

Ossokmanuan
Lake.

mile long, with a slight current, joins Gabbro and Ossokmanuan lakes. The latter is a narrow body of water more than forty miles long, and lying nearly east-south-east. From its northern outlet it trends directly south for eight miles, and in this portion varies from two to four miles in width, being dotted by many small rocky islands, and surrounded by low rounded ridges of drift covered rocky hills, with rock showing below the drift in many places along the shore. Another bay stretching away more than twenty miles to the north-west now joins the main body. Like the first it is full of islands, many of them composed of coarse drift. The south side of this bay is bounded by a ridge 300 feet high, and at its head a small branch falls in, which drains a number of lakes to the south-westward and forms a canoe-route to Lake Ashuanipi, on the way to the Moisie River. From the junction of the two bays, the main body of the lake extends south-east twenty miles, and then south-south-east fourteen miles. Five miles up the first course, the foot of one of two high, rocky, large islands is reached. This island is six miles, and the other ten miles long, and they practically divide this portion of the lake in two. The part on the south side of the islands averages two miles across, the northern channel being somewhat narrower. On the north side near the head of

Valley River.

the upper island a branch called Valley River flows out. This stream is somewhat larger than the northern outlet, and constitutes the river which at present flows down the Hamilton River valley above its junction with Bodwain Cañon. According to our guide, after passing through two lakes, together about twenty miles long and connected by rapids, it begins to fall rapidly in a succession of low chutes. About these chutes the valley is still wide, with gently sloping walls and not like the cañon on the main river. The guide had never visited the river below the chutes, but had heard that there was a high fall on it, some fifteen or twenty miles above the place at which the main body

of the Hamilton River enters the valley at the mouth of Bodwoin Cañon.

Besides the large islands already mentioned, there are only a few small ones, formed of drift, in the southern half of the lake. The water is clear, but has a brownish tinge and is never very deep. A continuation of the high ridge on the west side of the north-west bay runs on southward along the west shore of the main body, but gradually dies out towards the southern end. From the lake the land rises slowly upwards to this ridge, leaving a wide interval of flat land and low shores along this portion. On the north-east side the country is lower, and is only broken by a few rounded rocky ridges that have recently been burnt over. The trees about the lake are small, and are chiefly black spruce with larch and balsam fir, but no white spruce. Balsam poplar and mountain ash are seen growing in small straggling clumps on several of the low points on the west shore. Trees.

The river enters the lake on the west side, some ten miles from its south end, where it narrows to less than two miles. Its volume is considerably greater than the channel ascended to Ossokmanuan Lake, being half as large again as the Ashuanipi Branch at the end of the survey, and flows swiftly from the south in a shallow channel from 400 to 1200 yards wide, with low banks and frequent hummocks of gneiss for eight miles, to where it leaves Lake Panchiamitkats. The country on both sides of the river is slightly higher than about the lake below, and much fine drift is seen on the islands and shores arranged in long parallel ridges from thirty to one hundred feet high, running parallel to the glacial striae or a little east of south.

Lake Panchiamitkats is about twelve miles long and averages two miles in width, with its longer axis running due north-and-south. It is dotted with a few small islands, and has low drift shores. There is a prominent rounded hill on the west side just beyond the entrance of the river, five miles above the outlet. Another hill rises from the east shore opposite the inlet; the remainder of the country is covered with low ridges that run parallel to the lake. Panchiamitkats Lake.

The river above its entrance to this lake, flows from the west for a mile and then from the south, and is separated from the southern end of the lake by a narrow ridge only. It continues from the south for sixteen miles, to where it flows out of Lake Attikonak. Its channel is from 200 to 600 yards wide, obstructed by small rocky islands, while its shores present many rocky points. The current everywhere is strong, and the stream is frequently broken into short rapids between the many small rocky islands. Ten miles up, where

the river passes over rocky ledges, there is a chute of four feet, followed by a short heavy rapid that necessitates a portage. Above the chute the current is slack and the river nearly half a mile wide, with low sandy shores, to within two miles of the upper lake, where there are two short rapids, the upper of which is wide and very shallow, as the river issues from Lake Attikonak. The country surrounding this stretch of river continues low, with long, rounded ridges from fifty to one hundred feet high. The timber is similar in kind but perhaps slightly larger than the last described.

Lake Attikonak.

The east shore of Lake Attikonak was followed in a direction a few degrees east of south for thirty-eight miles, to the head of a south-east bay. On account of the great number of islands that everywhere break its surface, no idea of its shape or size can be obtained without a complete exploration of its shore-line, which task, owing to the many deep bays in the lake, would have required more time than could be given to it. From a number of long leads seen between the islands, the lake must be at least twenty miles wide in places, and, according to our guide, its south end is considerably beyond the head of the bay where the route leaves it. A large stream flows in at the south end, which rises in lakes to the south-west of Attikonak, near the head waters of the Magpie River, flowing into the St. Lawrence; and it is used as an alternative route to and from the coast by the Indians of the interior.

Large islands.

Many of the islands in Lake Attikonak are large and high, one of them rising into a rounded hill of 300 feet, others seem to be formed wholly of fine sandy drift, with irregular outlines, and scarped banks up to one hundred feet in height. Very little rock is seen except in the south-east bay; elsewhere the shores are generally sandy, with low, boulder-strewn points. The water of the lake is clear with a brownish colour, and does not appear to be very deep. The eastern side is bounded by low ridges of drift, with a range of hills from 200 to 300 feet high some few miles behind. At the south end of the lake, there is a sharp rugged range of hills, extending away westward, probably more than 400 feet high. The trees continue to increase slightly in size, black spruce predominating, but associated with balsam fir, larch and white birch, the last often occurring on the islands and points in large clumps with many trees up to ten inches in diameter. Near the south end of the lake, two small clumps of dwarfed aspen were seen, the first noted since the Grand Falls were passed.

From the outlet, the lake lies due south for twelve miles and is from one to three miles wide, with several deep bays running off on both sides. A large stream falls into a bay on the east side, immediately

above the rapid, while another enters from the west three miles farther south. Above this the course changes to south-south-west, and continues in that direction through a labyrinth of islands for sixteen miles to a short narrow leading into the south-east bay, which was followed for twelve miles, to its head. This bay gradually narrows from two miles to less than a half mile at its head, where a small stream flows in with a short, steep rapid. The shores and islands of the lower half of the bay are formed of sand and boulders, while along the upper half they are steep and rocky, with the country behind higher and more rugged with very little drift, the bare rock rising everywhere in small knolls. Here the trees become much smaller and are wholly black spruce and larch.

The route passes up the small stream last mentioned, a short distance to a very narrow shallow lake at its head. A portage of two miles, over and between a number of small rocky hills with swamps between them, joins the last lake with a little stream emptying into the Romaine River. The country about the portage has been recently burnt over, and the standing blackened trunks of the small spruce give a sort of hairy appearance to the otherwise bare rocky hills, from which all the vegetable soil has been removed, and do not add to the beauty of the scenery, which is very rugged and desolate.

Portage to
Romaine
River.

Romaine River.

It is only a quarter of a mile by the little stream from the end of the portage to the Romaine River. The latter where joined varies from fifty to one hundred yards in width, and for two miles passes between low banks, broken by rocky knolls. At the end of this distance there is a short heavy rapid, where the river passes over a rocky ledge between small islands. A portage of fifty yards is necessary here. Below this, for six miles to the upper Burnt Lake, the banks are low and sandy and often overgrown with willows and alders. The river winds backwards and forwards with a moderate current, and has formed a delta of low sandy islands where it enters the lake. On the east side there is a large lake that is separated from the river only by a narrow low point of sand. This lake has a short discharge which joins the main stream three miles below the rapids. The country surrounding the river is slightly rolling on the west side, with rocky hills from 50 to 200 feet high. The water of the river is dark-brown in colour, and carries more suspended matter than the rivers of the eastern watershed.

Upper
Romaine
River.

Headwaters.

According to the guide, about ten miles above the place at which the portage-route joins it, the Romaine River issues from a narrow lake nearly twenty miles long, that extends north-eastward, and is called Tishinakamau Lake.

Beyond the head of this lake the river is very small, and soon breaks up into little branches, the discharges of small lakes near the headwaters of the Elizabeth and Minipi branches of the Hamilton River, and also near the sources of the Natashquan River, that flows southward into the St. Lawrence. Portage-routes connect the heads of all these streams.

The Burnt Lakes.

Upper Burnt Lake is twenty miles long and varies from one to four miles in width. From its head, for six miles, its course is east-south-east, and then changes to south-south-east to the lower end. Twelve miles from the upper end, a deep bay extends south-west for five miles. The middle portion of the lake is for several miles greatly obstructed by long islands of drift. The country surrounding the upper part is low, with long sloping hills quite different from the rounded knolls previously passed; for there is a change in the rocks of which they are composed, the former being granite, the latter gabbro. Towards the south end, the country becomes higher and rougher, with the ridges closer together. Small black spruce and larch predominate, with some white birch on the islands.

A short rapid at the south end of the lake, joins it with the second Burnt Lake, which is four miles long, with a deep bay on the west side. Another short rapid and a mile of river connects this with the third Burnt Lake, which continues southward for two miles, and then turns abruptly north-west for five miles to another short heavy rapid that flows into the lowest Burnt Lake, the south shore of which was followed westward two miles to its outlet. A long bay extends northward several miles, and a portage at its head connects with the south bay of the upper lake. The country about the lower lakes is quite rough, with sharp ridges of rocky hills rising from 200 to 400 feet directly from the water. The forest about all these lakes has been devastated by a great fire some ten years ago, and now only small patches of green woods are seen in swamps and in spots along the banks.

Character of the river below Burnt Lakes.

As it passes out of the last Burnt Lake, the river falls twenty-five feet in less than a quarter of a mile, in a heavy rapid, over huge boulders and a few ledges of rock. For seventeen miles from the lake, to where a western branch joins, the general course of the stream is due south. Half a mile below the first rapid, the river again falls twenty feet in one

hundred yards, over masses of huge boulders. From here it winds to and fro, with a strong current, between steep banks of stratified sand from ten to fifty feet high, in a valley from two to four miles wide, bounded on both sides by steep rocky hills that rise from 400 to 500 feet above it. About seven miles above the forks, the river is broken by small rapids at intervals for nearly four miles; here the valley is much narrower and the scarped banks are occasionally 150 feet high, with rock coming out from beneath. The west branch has about half the volume of the main stream, and enters it with a heavy rapid from a narrow valley between the hills. The trees are everywhere burnt, except in a few patches here and there, along the river-banks. They are somewhat larger, and white spruce grows on the points and islands. Distinct terraces are seen at intervals, with elevations of 10, 20, 50 and 60 feet above the present river-level, cut out of stratified sand with a large admixture of clay.

Terraced drift
banks.

Below the forks, the river is from 100 to 300 yards wide, and flows swiftly in a shallow channel with a sandy bottom and steep banks of the same material from ten to thirty feet high. For eight miles the general course is south-east; it then turns south, and flows in that direction sixteen miles. At the bend there are on the west side several sharp, irregular hills of drift which extend one mile to the foot of the steep rocky hills. One of these hills cut into by the river, shows the sand and gravel to be false-bedded, and, in other places along the river, the bedding of the sands is not horizontal. These hills are thickly strewn with boulders, which do not appear to be scattered through the mass, but only over the upper surface, leading to the belief that the deposition and stratification of the drift took place in ice-water flowing under the glacier, and that the boulders on the surface were left there by the ice on its dissolution.

Below the bend, the valley narrows gradually for four miles, to two chutes, where it is less than a mile across, and is filled with sharp hummocks of drift from 50 to 150 feet high, covered with boulders. At the upper chute, the river passes along the base of a granite hill that rises sheer for 500 feet. This fall has a drop of four feet, followed immediately by another of six feet, ending in fifty yards of heavy rapids, where the descent is twenty feet. Fifty yards below is the second chute, twenty feet high, followed by heavy rapids for three miles. The banks immediately below this chute are from 50 to 100 feet high, and sections show them to be composed of re-arranged till, with false bedding; the angle is so high that in places it is impossible to walk along the foot of the cliffs, owing to the displacement and

Character of
the valley.

slipping of the sand along the bedding planes. Terraces up to sixty feet are numerous along the sides of the valley.

Below the rapid, for nine miles, to the next bend, the current gradually slackens, until it flows along with an even rate of about three miles an hour. The channel widens from 50 to 200 yards, and the valley also opens to nearly two miles, with sharp rocky hills bounding it on both sides, those to the west presenting high cliff-faces. The sharp hummocks of till gradually die out, leaving low and almost flat stretches to the foot of the hills on either side. The country is wholly burnt. The next bend is to the south-west for ten miles, and for that distance the river preserves the same character as above, but is slightly wider, being now about a quarter of a mile across. Six miles from the bend, a small branch, forty yards wide, comes in from the west. The old burnt woods end near the bend, but a fire of the present season (1894) has passed over all the remaining green woods below, and has practically destroyed all the forest along the river.

Extensive
burnt areas.

The river now turns south for six miles to where the portage-route to the St. John River leaves it by a small western tributary. The channel along this stretch varies from a quarter of a mile to half a mile across; the river is very shallow and greatly obstructed by large sandy shoals. The valley is more than two miles wide, and the hills bounding it rise sharply from 600 to 800 feet above it. A small branch joins from the west two miles below the last bend. Below the place at which the portage-route leaves it, the river flows south-east for four or five miles, in a wide shallow channel that slowly contracts as the current increases, and finally breaks into heavy rapids where the river passes into a narrow cut between steep high hills. Nothing is known of the river for over fifty miles below this point, except that it is quite impassable for canoes, probably on account of long rapids with perpendicular rocky walls, where portages are impossible. Nothing but the absolute impossibility of passing up and down this part of the river, would induce the Indians to make use of the present portage-route between the Romaine and St. John rivers, which is the longest and worst of those known to the writer anywhere in north-eastern Canada. Careful inquiries from a score of Indians met coming inland, afforded no information concerning this part of the river, which has never been descended by any one so far as known.

Difficult portage-route to
St. John
River.

Portage-route between the Romaine and St. John Rivers.

Tributary of
the Romaine
River.

The small branch previously mentioned, was ascended from the Romaine half a mile, to a portage three-quarters of a mile long, past heavy shallow rapids. The portage passes along the west side, through

burnt woods and over sandy hills that rise from 50 to 100 feet above the river on the slopes of the rocky hills bounding the narrow valley. Beyond this the stream is followed for a quarter of a mile to a portage of the same length; after which it is ascended for half a mile to a portage of one mile, followed by a stretch of river one mile long, above which the stream divides. The valley of the south branch is followed with a half mile portage, to a small lake two miles and a half long, from which a portage of a mile and a half leads over the height-of-land between the Romaine and St. John rivers. The branch, as will be seen from the above description, is full of long, shallow rapids, and flows through a narrow valley between steep rocky hills, from 200 to 300 feet high, fronted by lower hills of sandy drift, over which the portages pass. The hills along the small lake are somewhat higher and more rugged. The country travelled through is mostly burnt and the standing trees are small.

Beyond the height-of-land, the route passes for two miles and a half through two little lakes connected by a short portage. From the discharge of the second lake, a portage of three-quarters of a mile leads up hill to a small pond, and then down hill across the discharge of the last lake to the foot of a high fall. Next follows a short stretch of river, with a three-quarters of a mile portage past heavy rapids, closely followed by three short portages, past chutes. These portages, though short, are exceedingly bad, going straight up and down the rocky walls of a narrow gorge, over great blocks of anorthosite. The last ends in a narrow lake hemmed in by rocky walls that rise sheer from 500 to 800 feet above the water, and often present over-hanging cliffs, the sides being partly wooded with small spruce and birch that form a pleasing contrast to the bare rock elsewhere. In many places great blocks have been detached from the cliffs and are heaped up at their base. A number of small streams fall perpendicularly over the cliffs.

Tributaries of
the St. John
River.

At its discharge, the river falls seventy feet in as many yards, through a narrow pass partly filled with huge angular blocks. The portage is along the side of the cliff, often straight up and down, over blocks and through the water, the whole making the worst possible combination of obstacles. Below the portage, the river is followed for a mile and a half to its junction with a larger stream from the west. Just below the last-mentioned portage a large stream falls in from the east with two chutes over 300 feet high. Lower down, a smaller stream comes in on the same side with a higher fall, which shows that the valley is much below the general level of the surrounding country.

Cliff Lake.

The next portage leaves the river a short distance above the western branch, and in three-quarters of a mile ascends over 300 feet, ending just above a high chute on the west branch, where it falls, down a narrow gorge, to join the other branch below. This stream is then ascended for four miles, with two short portages past rapids on the way, before reaching Cliff Lake, which is eight miles long and from a half to one mile wide. The scenery about this lake is very striking. Both sides are formed of vertical cliffs, often rising sheer from 500 to 600 feet above the water and terminating, in the higher points, in bare, rocky knolls, without a particle of soil. In many places great masses of rock have broken away, and are now piled up in confused masses that extend far out into the lake. At every depression in the walls of the valley, little streams fall into the lake and are fringed by small trees of spruce and birch, which also grow along the edges of the lake and in rocky crevices up the sides of the cliffs.

Trees.

The small stream that flows in at the head of the lake is ascended for three miles, through two small lake-expansions, to a portage of one mile ending in a very small lake at its head. The next portage is two miles and a half long, and follows a valley between high hills, first ascending to the head-waters of the stream last followed and then down another small brook flowing in the opposite direction. This portage, besides being long, is very rough, leading over broken rock and through swamps. It ends in a small lake, out of which a little river fifty feet wide issues and flows southward with a winding course and strong current, in a deep valley about one mile wide. Its banks are low and generally sandy, and the valley is covered with a thick growth of small black spruce, larch, balsam fir and white birch, somewhat larger than any previously seen on the route from the Romaine River, but still too small to be of any commercial value. This little river was descended for eleven miles to where it is joined by a small western branch, which was ascended for one mile, through a shallow lake. Thence a short portage leads to another very small lake on the same stream, followed by still another portage of a third of a mile into a third small lake at the head of the stream.

A portage two-thirds of a mile long next leads up hill to another small lake, from which a portage of three miles follows the stream issuing from it, and descends 600 feet to the next lake below. There is here a general fall in the surface of the country and a change in the outline of the hills, as the route passes from the rugged anorthosite area, with its high knob-like hills, to the lower and more rolling country underlain by gneiss.

The lake at the foot of the portage is a little over two miles long, and its discharge is followed four miles and a half, with five portages past shallow rapids. A portage of a half mile passes up from the stream over a hill 300 feet high to a lake 100 feet above it. This lake and its outlet are followed three miles, with two short portages on the way, to the last portage to the St. John River, which leaves the small stream and passes down a steep gully cut out of drift for about one mile, where it descends 365 feet to the level of the St. John River.

Portages to
the St. John
River.

The total number of portages from the Romaine to the St. John is thirty-one, and their combined length aggregates nineteen miles and a half.

St. John River.

The St. John River, where the portage-route joins it, is about 100 yards wide and pursues a winding course in a valley about one mile wide, bounded by steep hills from 200 to 500 feet high.

St. John
River.

There is a great accumulation of drift in the valley, out of which the shallow channel of the stream is cut. The banks are mostly low where the river crosses the valley, and are high only at the bends, where sections from ten to sixty feet deep show stratified sands overlying clay.

A few miles above the portage, the river is broken by heavy rapids and chutes, and is almost impassable for canoes. Below, the gradient of the valley is steep, and the river in consequence has a strong current, especially at the bends, where it generally falls with short rapids through narrow channels cut out of the shingly shoals that obstruct it. It greatly resembles the rapid-flowing streams of the Gaspé Peninsula. Eight miles below the portage a large branch joins from the east, the head-waters of which form the various streams of the portage-route already described. Below this branch the channel widens somewhat and continues to wind from side to side in the valley for twenty miles; the hills then close in, and the river descends a narrow gorge, with a heavy rapid ending in a fall of twenty feet.

The trees in the valley show a marked improvement both in size and variety. White spruce fifty feet tall and from twelve to eighteen inches in diameter is plentiful, along with larger black spruce, balsam fir, larch, white birch, balsam poplar and aspen. The sides of the valley are more than half burnt.

Trees.

The portage past the chute is nearly a mile long and passes along the almost perpendicular side of the valley some 300 feet above the stream. The ascent and descent at both sides is so steep that the Indians are

forced to cut steps out of the soil in order to pass over with loads. In the middle it is close to the rocky wall, and the road has been made by placing logs along narrow parts, which almost overhang the boiling stream far below.

Salmon
Branch.

A mile below this portage the Salmon Branch joins from the west. It has a deep valley like the main stream and is considerably smaller. About a mile below this branch there is a salmon fishing camp, with a fine large house situated on a wide bank at the mouth of a small stream, the resort of sportsmen during the summer.

From the chute the general course of the river-valley is almost south for twenty-five miles, to the coast. The valley is narrower than above, and for ten miles does not exceed half a mile, with walls of anorthosite rock rising in nearly perpendicular cliffs from 300 to 600 feet above the water. As the coast is approached, the valley widens and the hills become lower, so that a short distance below Chambers River, or ten miles from the mouth, the rocky hills give place to banks of stratified clay and sand that gradually decrease in height down to the sea.

The country surrounding the river has been over three-quarters burnt, and the remaining forest is very similar to that already described.

The river from the chute to its mouth varies from 200 to 400 yards in width. It is quite shallow and has a very rapid current, with many short rapids, as it winds from side to side in the valley. The limit of tide is eight miles and a half above its mouth.

Manicuanan River.

Position of the
mouth.

The Manicuanan River flows into the St. Lawrence about two hundred and forty miles below Quebec. Within ten miles of their mouths, the Manicuanan and Outardes rivers are separated only by a high sand plain, about two miles across. Above and below this place, their courses diverge, so that their mouths are fifteen miles apart, and the land between forms a broad peninsula composed of stratified clay and sand, evidently brought down by the rivers. The channels, thus diverted, instead of passing out into the Gulf of St. Lawrence, hug the shore for several miles with wide sandy shoals outside. The Outardes water flows westward, and that of the Manicuanan River towards the east. Owing to the channels being in-shore and to their broadening as they leave the mouths of the rivers, it is impossible to approach within ten miles of either stream with large vessels, while

anchorage is dangerous outside on account of insufficient holding ground, the bottom being sandy.

From the mouth of the Manicuan River, where the stream is about three miles wide and greatly obstructed with shoals bare at low water, the course is directly west for four miles, to where the rocky point projecting from the north side narrows the stream to less than half a mile. Above this, the west course continues two miles, with rocky banks and, towards the upper end, with a number of small rocky islands, between which the river flows with a rapid current. A sharp bend to the north now leads to a succession of heavy chutes that obstruct navigation for the next two miles. The river, while passing the chutes, rushes through a narrow gorge from 200 to 300 feet wide, with low rocky walls. The highest direct fall is about 30 feet, while the total descent is 110 feet. The volume of water passing down is very great, being over half that of the Ottawa at the Chaudiere Falls. The portage is divided into two parts, the upper half being only used during high water; at other times short portages are made up or down this part of the gorge.

Volume of
water.

A short distance above the upper portage, a road climbs a high bank of modified drift, and leads to the Outardes River, some three miles distant. This route is frequently used by the Indians, to avoid the long coast journey, from the mouth of the Manicuan River to Bersimis, where they reside during the summer months.

Above the portage the river widens to about 500 yards, and continues from the north for five miles, after which the valley bends to the north-east, for a similar distance, to the next portage. Several long islands of drift occur in the upper half of the stretch between the portages. The valley is about one mile wide, bounded by rounded, rocky hills, 600 feet high and flanked by thick deposits of stratified clay overlain by sand. These superficial deposits are terraced at frequent intervals up to an elevation of 350 feet above the water-level. The clay deposits do not rise more than 100 feet above the river and are horizontally bedded. The banks and hills are well wooded with large trees of the following species, arranged in their order of abundance:—White birch, white spruce, aspen, black spruce, balsam poplar, balsam fir, yellow birch, Banksian pine, white pine and black ash. Many of the spruce trees are sufficiently large to afford good commercial timber. The current along this stretch gradually increases from two to four miles per hour as the stream is ascended.

Timber.

The next portage is about two miles long, and, for the greater part of its length, passes over a sandy plain 320 feet above the river at its lower end. Steep hills of clay and sand are found at either end, and,

being constantly wetted by small streams, are very difficult to ascend or descend with heavy loads. The river here again passes, with heavy rapids and chutes, through a low rocky gorge; the fall is 165 feet.

Above the portage the valley again widens and the next portage is thirty miles farther up. The course of the valley for the first nine miles is due north; its walls are from half a mile to one mile apart, rising in abrupt rocky cliffs from 600 to 1000 feet, the river flowing close to the western wall, with a wide interval of sandy bottom-land intervening on the east side. The stream varies from a third of a mile to half a mile in width, and its channel is broken in many places by sandy shoals. The current is even and averages about three miles an hour.

Toolnustook
River.

The valley next bends to the north east for four miles, and again to the north for six miles, where a large branch called the Toolnustook or Elbow River, joins the main stream. This branch comes in through a deep valley from the north-east, and takes its rise in the same lake out of which the Godbout River flows. Along the lower bend of the stream, the mountains forming the western wall of the valley are greatly broken and rise in detached rounded hills more than 1000 feet above the river. One of these mountains, immediately at the bend, towers upwards, with bare rocky walls, directly from the water, and is named by the Indians the "Manitou Pulpit." Above the bend the valley widens to more than two miles, and continues so to the mouth of the Toolnustook. Wide terraces occupy both sides between the hills and the water, and are covered with a fine growth of trees similar to those named above. The current quickens as the fork is approached, and there flows steadily at a rate between three and four miles an hour, in a shallow, sandy channel. Above the forks, the main valley changes its direction to nearly north-west, and for the next twelve miles averages a mile wide, with high rugged hills of anorthosite forming its walls. The river here varies from 200 to 300 yards in width, and flows with a very strong current, as it winds from side to side down the valley. At each bend it reaches the rocky walls, while elsewhere it has high banks cut out of the heavy deposits of stratified clay and sand, which partly fill the valley in the form of terraces, of which the highest is 150 feet above the river.

Chesniup
Portage.

At the end of this stretch a high bank of terraced drift extends almost across the valley, apparently filling the old river-channel and forcing the stream through a narrow rocky gorge on the east side, where it descends 115 feet, in a succession of five chutes in about half a mile. The portage, named the Chesniup Portage, passes along the side of the west bank, where the terraced drift rises 250 feet above the water.

For thirteen miles above, the river continues narrow, crooked and swift, with frequent short rapids and a couple of dangerous whirlpools, in a valley from a quarter to half a mile wide, surrounded by irregular, rounded hills from 400 to 500 feet high. Down every depression between the hills on both sides, small streams fall in beautiful cascades from the higher lands surrounding the valley. The drift, along the lower half of this stretch, is not heavy, and narrow terraces are cut into it up to about one hundred feet above the present level of the river. As the upper half of the distance is ascended, the valley widens, and the rocky walls are somewhat lower and more regular. With the increased width of the valley the channel also widens to a quarter of a mile and the current slackens. The valley now straightens, and for twenty miles runs slightly east of north, widening to nearly two miles, with regular rocky walls on either side. The river along this portion averages half a mile in breadth; it is very shallow, and is broken by a number of low, sandy islands and shoals. The current is even and moderate, and the banks are low, rising in wide terraces to the rocky walls. About six miles up this stretch a burnt area is entered, which extends up both sides of the valley, leaving only a narrow fringe of green woods at intervals along the river-margin. The timber in the valley and on the hillsides is all of fair size, and much of the white spruce is of good quality and in sufficient quantity for profitable lumbering. Black spruce predominates, followed in decreasing order by white birch, aspen, white spruce, balsam poplar, and Banksian pine. The northern limit, in this valley, of white pine, yellow birch and black ash appears to be along the crooked stretches close to the Chesniup Portage.

Character of
the river
valley.

About half way up the last described stretch, a portage-route leaves the river on its west side, and, after passing over the wide, sandy plain, ascends a gulley in the hills to a small lake on the table-land, some 500 feet above. Thence two or three other small lakes are passed to a larger one, called Tetiskouskua, the outlet of which is descended to the Outardes River. This is the route followed by the Indians who hunt along that stream, in order to avoid the many long portages along its lower part.

Portage-route
to the Out-
ardes River.

The valley next again turns more to the eastward, and then bends to the north for twenty-four miles, to the next portage. It narrows, and the river becomes deep with a rapid current. The lower part of the valley contains much drift, which is in part terraced to a height of 200 feet above the river. Clay is no longer seen; the stratified sands extend downward to the water's edge, and are often

capped with thin beds of fine gravel. In most places the bedding is nearly horizontal, but in a few places the angle of bedding is considerably inclined and the drift appears to have been, at least in part, deposited under or in cracks of the glacier. The walls of the valley are still rocky, and vary from 500 to 800 feet in height. Much of the forest has been destroyed by fires at different times, the latest having occurred about fifteen years ago. The older burnt areas are grown up with thickets of small white birch, aspen, black spruce and Banksian pine. On the unburnt portions the trees are considerably smaller than those already noted, and the quantity of white spruce is much less, black spruce predominating.

Branch
Portage.

The next portage crosses the neck of a small peninsula, formed by the main stream and a branch which comes in from the east. The portage is about half a mile long and passes over a level plain of sand 250 feet above the river at its lower end. The upper end of the portage comes out on the small branch, about fifty feet wide and very deep, which winds with a sluggish current between high sandy banks, for nearly two miles, to where it joins the main stream. The river just below passes into a very narrow, rocky gorge, where it descends 175 feet in less than two miles.

From the mouth of the small branch to the next portage, the distance is five miles and the course of the valley about north-west. The valley is narrow, and the hills on either side rise in almost perpendicular cliffs, directly from the water, to heights ranging from 500 to 1000 feet. A little drift is seen, terraced to 100 feet, and through this deep, narrow valley the river rushes in a deep channel, with many stretches of broken water.

Kikaskuatagan
Portage.

The next portage is called Kikaskuatagan, and is nearly a mile long. It starts from a steep, rocky ledge, where, owing to the constant heavy swell, unloading is very dangerous. The road leads up a narrow gully filled with rough broken rock, and ascends almost perpendicularly for a hundred feet to a sandy terrace, which it follows to the head of the portage, where a steep drift hill is descended. The river at this place falls about twenty feet, with heavy rapids, where the channel is obstructed by numerous boulders. During high water the lower end of the portage cannot be approached, and at such times a gully more than half a mile lower down, is used to reach the terrace. Above this portage the direction of the valley changes to north-north-east for eleven miles. For the lower six miles the river averages 100 yards in width, and flows in a deep channel at the base of the western wall, which here rises in perpendicular cliffs from 300 to 600 feet high, with numerous small streams falling in narrow white ribbons of spray

into the river. The eastern hills are less abrupt and are flanked by a good deal of sandy drift, terraced to one hundred feet above the river. Along the upper five miles of this course, the valley widens and contains much drift; the grade of the river is here very heavy and, as the bed widens, it becomes divided into numerous channels by low shingle bars, over and between which the stream rushes at a rate of five or six miles an hour, so that it is exceedingly difficult to ascend with loaded canoes.

The course of the valley next changes to north-west and continues in that direction seven miles. A short distance above the bend, the walls again approach and, two miles above, are less than a quarter of a mile apart. As the stream is ascended, its channel narrows and deepens, and it flows very rapidly between steep banks of boulders or rock for four miles, to where the Long Portage leaves it. Above the lower end of this portage the stream is still more contracted, and is walled in by steep rocky cliffs on both sides, where it is impossible to enter or leave the valley with canoes for the next three miles. In this distance the river is interrupted by a number of low chutes, which at low stages of water can be passed with canoes in descending. The portage leaves the valley on its east side, at the mouth of a small tributary. A sharp ascent of 250 feet leads to a terrace of coarse sand and gravel, formed along the flank of a rocky hill. This terrace is followed about one mile, and then a sharp bend to the north carries the road, in the next half mile, over the shoulder of the hill, to a small lake 560 feet above the river. A short portage leads from this lake to a slightly larger one, from the north side of which another portage one mile and a half long again leads down to the river, after first passing over a flat drift plain between the hills. The trees surrounding the lakes are mostly small black spruce, with a few fir, larch and white spruce, none of which are of commercial value.

Above the Long Portage, the still contracted valley stretches due north for three miles, when it changes to north-north-east for eight miles, to the next portage. The river, along the lower half of these distances, is deep, narrow and very swift, with steep banks of rock or large boulders. Along the upper half it alternates between long stretches of quiet water, and short rapids, where heavy banks of coarse drift project out from the sides, contracting the channel.

The portage, at the head of these courses, is about 100 yards long, and passes a heavy rapid full of large boulders, where the stream falls over a low ledge of rock. From here, to the outlet of Lake Ichimanicuagan, six miles above, the valley continues in the same direction

as the last course, and gradually widens to about one mile. The hills forming its sides rise very abruptly from 600 to 1000 feet, and in most places their sides are bare rock, with straggling spruce and birch trees growing here and there in crevices. The river gradually widens, and after a short rapid, about two miles above the portage, its current slackens, and it passes imperceptibly into the lake. The rocky walls are flanked on both sides with some quantity of drift, cut into terraces at various heights, up to 150 feet above the water, these terraces being well wooded with spruce, aspen and birch. Numerous large trees of white spruce grow on the lower terraces, many of them more than thirty inches in diameter three feet from the ground.

Lake Ichimanicuagan.

The view at the outlet of Lake Ichimanicuagan is one of great beauty and grandeur, the quiet water of the lake contrasting in colour with the bright sandy shores, backed by the dark green of the spruce and the lighter-coloured birches and aspen, while the rocky walls of the valley rise abruptly on both sides, bold and bare, with a fringe of small trees crowning their summits. Out of every depression in the hills above a stream issues, falling in most places directly down the rocky walls from 300 to 800 feet. One stream in particular, on the east side, is of considerable volume and has a sheer fall of upwards of 500 feet. In its descent it dashes against the almost perpendicular wall, and, by the time it reaches the lower level, is completely broken into spray.

Previous surveys.

Tributaries.

Lake Ichimanicuagan is the lower of the two great natural reservoirs which collect the waters of the upper portion of the Manicouagan River. The lake lies in a deep narrow valley, a continuation of that of the river lower down. The water surface is 685 feet above sea-level, and nearly as many feet below the level of the surrounding country. This lake was not examined by us, but was surveyed in 1872 by John Bignell, P.L.S., and was found by him to be sixty-three miles long, while its breadth varies from half a mile to two miles, giving an average breadth of one mile, the southern half being the narrower. The lake is crescent-shaped, so that a line drawn from the two ends runs nearly north-and-south, while the convexity of the curve is towards the east. The principal river flowing into the lake, enters it on the west side, about four miles above the outlet, and forms the discharge of Lake Mouchalagan, the upper large lake. The other large streams entering the lake are three in number, but they do not compare in volume with the last mentioned. Two come in on the east side: the lower, called Gabriel River, enters about half way up; the other, called Wachagamau River, flows in about ten miles from the north end, and is used by the Indians as a route crossing to the head

waters of the Ste. Marguerite River. The third river flows into the north end, and is exceedingly rapid, as it descends quickly from the table-land to the level of the lake. It rises some forty or fifty miles to the north and north-east, in a number of lakes, of which the waters interlock with those of the main stream on the west, the Ste. Marguerite on the east, and tributaries of the Koksoak River on the north.

As stated above, the main stream, flowing into Lake Ichimanicuan, comes in from the west about four miles from the outlet, This river, which equals at least three-quarters of the volume of the outlet, enters the lake through a deep narrow gorge, nearly at right-angles to the main valley, and also cuts almost directly across the strike of the rocks. For three miles above the lake, the valley is not over 200 yards wide and is walled in by rocky hills, which on the north side rise in perpendicular cliffs from 800 to 1000 feet; the south wall is equally high, but less abrupt, and is about one half wooded with small spruce and birch. The river has an average breadth of one hundred yards, and flows swiftly in its deep narrow channel, which is frequently partly blocked with huge masses of angular rock, fallen from the overhanging cliffs of the north side. Several small streams tumble in from the high lands on the south side, in series of beautiful waterfalls. After three miles, the valley curves gently towards the north for four miles, widening in so doing, and thus allowing for a narrow interval of terraced drift between the river and the walls of the valley. The east wall continues abrupt, but farther up the stream it gradually decreases in height, and the scenery loses much of its wild grandeur. The course of the valley next changes to nearly north-east. here it widens, and its walls become lower and much less rugged, so that in the upper part, the surrounding hills do not rise more than 500 feet above the stream, and have well wooded, rounded outlines. The current throughout is swift, and two miles up this course, a large ledge of rock, crossing the stream, causes a low chute and heavy rapid, passed by a portage of one hundred yards on the east side.

Manichalagan
River.

At the upper end of the course, the stream bends quickly to the north-west, and for more than a mile is broken into broad low chutes and heavy rapids. This obstruction is passed by a portage nearly a mile long, of which the lower end is found a short distance up a small stream which flows in on the west side at the foot of the rapids. The portage rises rapidly 170 feet, to the level of a flat sandy terrace, and then crosses northward; on the level, to the river, where a sharp scarped bank of sand is descended.

Upper rapids.

From the upper end of the portage, the stream gradually bends to the westward for the next five miles, to where it flows out of Lake Mouchalagan. Along this portion the banks are not high, and the rounded rocky hills are quite distant, so that the country on either side of the river is low and flat, and is thickly wooded with spruce, Banksian pine, fir and birch, somewhat smaller than before noted.

Lake Mouchalagan.

Lake Mouchalagan is not as long or as large as the lower lake, but, notwithstanding, contains a great volume of water. Its greatest length is forty-one miles, and its average breadth about one mile, being least in its southern half, and varying from one mile and a half to two miles in the northern part. In shape this lake also resembles an irregular arc, but with the convexity towards the west; on account of the opposite bends in these long lakes, their northern ends approach within fifteen miles of each other, and the interval there is occupied by low lands covered with lakes.

Height above sea.

The level of the lake is 830 feet above the sea, and its water is remarkably deep. Soundings made off Partridge-tail Hill, on the west side, about fifteen miles from the north end of the lake, give a depth of 466 feet, at one hundred yards from shore; while at a distance of 500 yards the depth is 655 feet, the greatest known depth of any lake in the Labrador Peninsula. The water is clear, with a brownish tinge.

Fish.

Owing to the great depth, but few places are suitable for the setting of nets, and consequently the fisheries are not well known to the Indians except in the northern part, where the sand brought down by the principal tributary has silted up the bottom and produced shallow water over a considerable area. Here large quantities of lake trout, whitefish, land-locked salmon, pike and suckers are taken in nets during the spring and autumn.

The shores of the lake alternate between wide rocky points and sandy bays, and the banks in most places rise in terraces cut out of thick deposits of drift that flank the rocky hills on both sides. The highest terrace is about 150 feet above the present level of the lake, and it is seen on both sides in all favourable localities.

The hills are, for the most part, well rounded, but broken by deep valleys, those on the west side rising from 200 to 500 feet above the water. On the east side they are low and regular until the middle of the lake is reached, where a range of high irregular-shaped hills of rusty garnet-diorite occupies the country back from the shore for more than ten miles, when they again die away in the low lands at the head of the lake. To the north of the lake a low flat country extends for

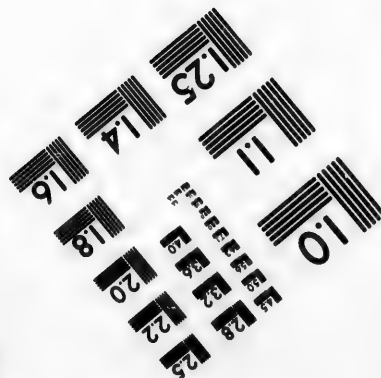
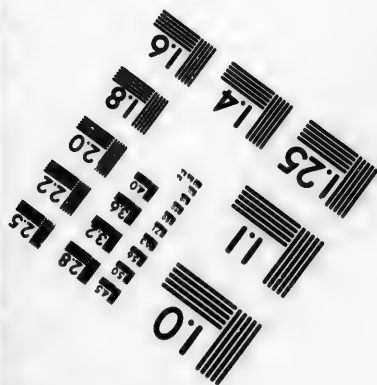
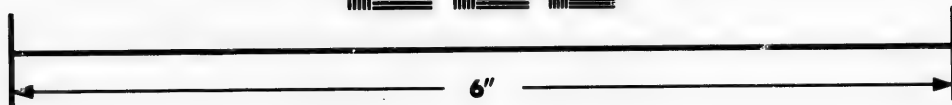
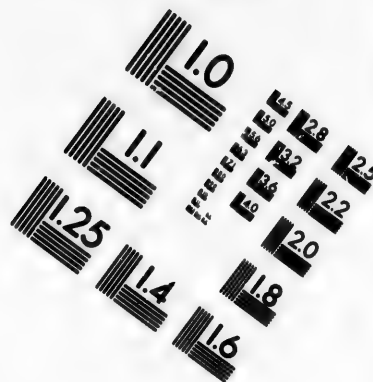
some ten miles, to the foot of a high irregular range of hills, which, from their outline and white colour are believed to be formed of crystalline limestone—an extension of the hills seen along the river above the lake and described later. Over three-quarters of the country surrounding the lake has, within the last three years, been devastated by fire, and in consequence only blackened trunks are seen in most places. The timber remaining is chiefly black spruce, seldom exceeding twelve inches in diameter, together with white birch, balsam fir, aspen, Banksian pine and a few larch, all growing thickly, but small in size.

A number of small rivers enter the lake, generally with falls close to their mouth. Most of them come in on the west side, and one of them, which enters a few miles south of the Partridge-trail, forms with its connected lakes, a route to Outardes River. The main stream, or Mouchalagan River, flows through a wide, flat valley on the west side, about five miles from the north end of the lake. Tributaries.

As before stated, wide shoals extend for more than a mile into the lake, dividing the stream into narrow channels, which render an approach difficult during low stages of water. For the first four miles from its mouth, the stream flows from the north-north-west in a channel more than a quarter of a mile wide, with low scarped shores and sandy shallow bottom, with a moderate current. At the head of this course, a large branch, called the Kawikwanipinis River, joins from the north-east. Its volume appears to be about one-quarter of the main stream below its junction. It is about 100 yards wide and averages six feet in depth, with a current of two miles an hour. Kawikwanipinis River.

This river, a short distance above its mouth, passes in a deep narrow valley, between high rugged hills of white crystalline limestone. From information obtained from the Indians, who hunt along the stream for many miles above its mouth, it is a succession of long heavy rapids and quite unnavigable, until near its head, where it flows out of a large lake called Mishinik, some fifty miles to the north-east of its mouth and close to the northern watershed. From the north end of this lake, portage-routes through small lakes lead north and north-east into the headwaters of streams flowing north into the Koksoak River, and eastward into the Moisie River. The portage-route to Lake Mishinik and past the rapid lower part of the river, is by a small tributary which joins the main stream fourteen miles above the Kawikwanipinis. This route is exceedingly long and rough, and quite impassable during the summer months for heavily loaded canoes, owing to the shallow streams and lakes connected by more than fifty portages, many of which are long and pass through deep swamps. The Indians





Photographic Sciences Corporation

**23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503**

18 20 22 25
E E E E E

10 11 12 13 14 15 16 17

wait at Lake Mouchalagan until winter sets in, and then haul their canoes and outfit over the portage-route, returning in the spring in their canoes. At this time they carry out only the furs caught during the winter, and in consequence pass over the portages in one trip.

High cliffs.

Above the Kawikwanipinis, the main stream, for the next fourteen miles up to the small tributary above mentioned, has a general direction from the north-west, with a number of minor bends on both sides of the course. It now enters a distinct valley, which narrows from a mile to less than half a mile across as the stream is ascended, with rocky walls from 300 to 500 feet high, often with perpendicular cliff-faces, especially along the upper half of the distance, where white crystalline limestone and rusty, decomposed gneiss are the prevalent rocks.

For five miles above the forks, the channel averages 200 yards in width, and a steady current flows over the sandy shallow bottom; farther up, the stream is broken into numerous channels by long islands of drift, often well wooded with medium-sized white spruce and white birch. The current here becomes swift with short shallow rapids, and poling is necessary in ascending with canoes. In many places thick sections of false-bedded sands and gravels are exposed in the scarped banks, and well-marked terraces were noted at 10, 20, 40, 60, 70, and 100 feet above the stream. The lower terraces are thickly wooded with trees similar to those found on the islands, along with black spruce, which predominates on the upper terraces and on the rocky sides of the valley. About one-half of the forest in the valley has been recently burnt.

Gorge.

The valley now turns due west for two miles and a half, and then nearly north for three miles and a half. Throughout these distances the river passes through a narrow rocky gorge with walls rising from 200 to 500 feet. The channel, in ascending, first narrows to about fifty yards and continues so for more than a mile. The current is very strong, and increases into a heavy rapid, with a low chute where the stream passes over a ledge of limestone. Above the chute the stream widens to 300 yards and is broken into numerous shallow channels by gravel bars and masses of coarse blocks and boulders. The stream here descends with heavy rapids. At the bend, the valley and river again narrow, and the latter varies from ten to 100 yards in width as it passes down over a number of short chutes connected by heavy rapids. With this character the stream continues to the head of the gorge, where the valley gradually opens up, and as it widens it becomes free from rocky ledges. This portion of the river can be navigated with canoes only at low stages of water, as then only can portages be made over the rocky margins between the steep walls and the water at the chutes.

The Indians never use this part of the stream; they pass it by a portage-route of which the lower end leaves the main stream on its east bank a few yards above the mouth of the already-mentioned tributary. The portage is short and ends on this stream, which is followed northward for a mile and a half in a direct line, but, owing to the stream winding from side to side in a valley about half a mile wide, the distance by water is more than four miles. The direction of the route now changes to north-west and continues nearly so to the head of the gorge. From the stream a portage of a mile and a half leads to a small lake 450 feet above the river. The route next passes through three small lakes connected by short portages, for two miles, and then by a portage of a mile and a half down hill to the river. The country surrounding the lakes is characterized by rounded, rolling hills partly covered with small black spruce and larch, with a few birch trees.

Portage past
the gorge.

From the head of the portage, the valley runs nearly due north, and quickly widens out to nearly one mile, with its bordering hills rising gradually on both sides to heights varying from 300 to 600 feet. The river has an average width of 400 yards for the next five miles, up to where the main portage-route leaves it. The channel is shallow and greatly broken by drift bars and low wooded islands, with a very swift current that averages five miles an hour and is occasionally broken into short rapids. Between the hills and the water there are wide intervals of terraced drift, the highest terraces being about 100 feet above the water. Scarped banks show the drift to be chiefly fine sand, with occasional beds of small gravel near the top, all showing signs of bedding at various angles to the horizontal. The trees in the valley continue to be of fair size and are chiefly black spruce, with white spruce, balsam fir, white birch, aspen, larch and Banksian pine.

The main stream, a few miles above where the portage-route leaves it at the head of this stretch, becomes very rapid, and flows in a deep, narrow gorge, with high, steep, rocky banks, where it is impossible to ascend with canoes, and very dangerous to descend. On this account, the Indians make use of a long and difficult portage-route, in order to reach the upper waters of the river. This route was passed over in ascending to the watershed, and will be described further on.

Portage-route
to head of
river.

Above this portage-route, the valley continues northward for seven miles. Along the lower part it is somewhat wider than the portion last described, and the river is also broader, with high drift banks, from beneath which rounded masses of rock outcrop at intervals.

Along the upper three miles, the valley gradually narrows and the drift on the banks of the stream give place to rock, which hems it in

and, as the grade is heavy, causes it to form wild rapids in a channel less than 100 yards wide.

Pepechekau
River.

On the east side, about one mile below the upper end of the course, a large branch called the Pepechekau River, enters the valley with a beautiful fall of fifty feet. This stream heads in the neighbourhood of Mishinik Lake, to the north-eastward.

Dangerous
rapids.

The valley, for the next twenty miles, runs almost straight north-north-west, with only a few minor bends. For the whole distance it never exceeds 400 yards in width in the bottom, and for many long stretches is less than one hundred yards across, with high, rocky banks rising abruptly from 300 to 600 feet, to the level of the irregular table-land above. The grade of the valley is steep, and down it the river, much confined, rushes in wild, heavy rapids, broken occasionally by short, low chutes. The shore is rocky, and broken with small, irregular points, past which the water rushes with great velocity and thus forms dangerous whirlpools. This portion of the river is exceedingly dangerous to travel, owing to the impossibility of making portages in most places, on account of the high, perpendicular walls of the valley and of the absence of any beach between their foot and the water. During the descent of this portion of the river it was only with the greatest difficulty and danger that the frequent landings necessary for the survey were made, and disaster was avoided in a number of places only by good luck. At a rapid pitch about half way down, one canoe was accidentally upset, and Paul Bacon, an Indian guide, was most unfortunately drowned in the whirlpools. Although the river was carefully searched below, no trace was found of the body of the unfortunate young man, nor of the canoe or its contents, which must have been caught in some of the eddies and sunk out of sight beneath the deeply-eroded, rocky banks.

Along the upper mile of this course, where the river first passes into the cañon, it falls 140 feet, in a succession of chutes over rocky ledges, the stream being broken into a multitude of channels by small rocky islands. The trees along the walls of the cañon are chiefly black spruce and a few white birch, with an occasional tree of white spruce along the lower portion.

Above the head of this gorge, the hills on both sides fall away, leaving a valley several miles across, bounded by broken ridges of rounded hills from 100 to 500 feet high. The valley is filled with a great accumulation of drift arranged in low ranges of drumlin-like hills, covered with boulders. The river now spreads out, and is broken

into numerous channels by the detached drift ridges, so that for the next fourteen miles it assumes a lake-like character, although everywhere the current is perceptible and in many places strong. This portion is called Natokapau. The stream continues to flow from north-north-west for eight miles, to where a large branch called the Attikopi River joins it from the westward. The main stream, or Itomami Branch, then changes its direction and flows almost due south. Several large streams from the surrounding country join the main river in this neighbourhood. On the west side two flow in below the Attikopi River, and drain small chains of lakes on the high lands, through which a portage-route passes to join the Attikopi River. Two other streams enter on the east side, within a short distance of the commencement of the cañon, while at the upper end of Natokapau a large branch called the Mossy-pine River, joins from the north-east, where it is said to head in several long lakes on the watershed, one of which, at least, also discharges northward into the Koksoak River.

Notakapau.

Branches.

Above the Attikopi, the main stream flows in short crooked courses down a valley from one to four miles wide, bounded by rounded hills from 200 to 500 feet high, that run in broken ranges parallel to the direction of the valley, or north-east and south-west. The lower lands surrounding the river are covered with ridges of drift, often largely formed of coarse boulders and angular blocks of rock. The summits of all the higher hills rise above the tree-line and are covered only with low arctic willows and shrubs. The trees growing on the low lands are small and stunted; over ninety per cent are black spruce, with a few larch and Banksian pines, and an occasional clump of small straggling white birch. The aspen is not found above the mouth of the Attikopi River.

The valley continues in a north-east direction for forty miles, up to the watershed, beyond which it was seen holding the same course for at least thirty miles farther.

Above the Mossy-pine River, the main stream is about one hundred feet wide in rapids, where the average depth is under two feet. Immediately above its junction there is a short heavy rapid leading from a small lake-expansion connected by short rapids with three others in the next seven miles. Above these, for twelve miles the river is narrow and blocked with small islands and huge boulders, past and over which it pouts in continuous heavy rapids. It then flows out of the lower of a series of lake-expansions that almost fill the bottom of the valley, and are only separated from one another by short heavy rapids. These continue for ten miles, until the outlet of Lake Itomamis is reached. This lake is five miles long, and from one to two

Character of
the upper
river.

Itomami
Lake.

miles wide, with several small irregular bays stretching away from the main body. It is surrounded by barren-topped hills that rise from 200 to 500 feet above it. Low shores, backed by drift ridges, intervene in many places between the water and the surrounding hills, and they are covered by patches of stunted black spruce and a few larches. The lake is fed by two large and a number of small streams. The largest flows in on the west side, near the south end, and forms the outlet of a chain of lakes on a portage-route to the head of the Attikopi River as described further on.

The second large stream flows into the north end of the lake, and, by two short rapids and a small lake-expansion, connects this lake with Itomami or Summit Lake, so called on account of its waters discharging in opposite directions; the southern outlet forming the head of the main branch of the Manicougan River, the northern flowing into Lake Kaniapiskau, and thence into Ungava Bay. The streams flowing out are about equal in size and volume, being about ten feet wide in the rapids of both discharges.

Summit Lake.

Summit Lake is cut by the 53rd parallel of north latitude. It is six miles long, and averages about one mile in width, with two lateral bays, which increase the width in the centre to three miles. It is estimated to be 1940 feet above sea-level. Like the lower lake, it is surrounded by rugged, rocky hills, arranged in roughly parallel ridges. These hills are all barren on the top; on the low lands surrounding the lake small black spruce grows, but only in open groves. A great part of the timber has been destroyed by fire, and the landscape has a most desolate, barren appearance.

Country about
the watershed.

From the summit of a hill that rises 565 feet above the water, situated on the east side of the lake near its north end, a fine view was obtained of the country about the watershed. The valley of Itomami is seen continuing in a north-north-east direction for more than twenty-five miles; beyond, it appears to bend towards the north, and a chain of long narrow lakes partly fills the valley, down which they discharge into Lake Kaniapiskau. Another wide valley stretches off towards the north, with two large lakes, the upper of which appears to be about 200 feet above the level of Summit Lake, into which it drains. To the westward are two more lakes, the lower separated only by a narrow strip of sand from Summit Lake. To the south, there is a narrow valley containing a chain of small lakes. With these exceptions, nothing is seen in all directions but rounded, barren-topped mountains, apparently considerably higher to the east, north-east, and north than about the lake, and the elevation of these mountains may vary from 300 to 600 feet above the lake, or from 2000 to 2500 feet above sea-level.

Attikopi Branch.

This stream, as before mentioned, joins the main river in a small bay at Natokapau. At its mouth there is a short rapid where the river passes down a channel about one hundred feet wide, over and between large boulders. For ten miles it flows in an irregular channel between low ridges of drift, thickly strewn with boulders and angular blocks of rock, on its way down from Lake Attikopi. The stream is greatly broken by rapids and chutes, and descends over 250 feet in the ten miles. The grade of the upper half is the heavier, and low ledges of rock along this portion cause frequent chutes. In all six portages, aggregating four miles in length, are necessary to pass these obstructions. Besides the low boulder-strewn ridges, occasional low hills of rock rise above the general level, and become more marked as Lake Attikopi is approached.

Junction with
main river.

This lake is very irregular in shape, and its surface is broken by many rocky islands. A long point, stretching out from the south side, divides it into two bays, with a third trending towards the north-east. From the discharge, at the south-east end, to its north-east inlet, the distance is about five miles, and its greatest breadth is about four miles. It is surrounded by broken ranges of rocky hills, from 200 to 400 feet high, the wide valleys between being characterized by low ridges of drift. Over one half of the forest has been destroyed by fire, and the remainder is chiefly small black spruce and larch, with a few Banksian pines and birches. Here the river divides into two branches of about equal volume. That flowing into the south-west bay is called the Kiche-wapistoakan River, while the one entering the north-west angle of the lake, is called the Attikopis River. The former flows from the south-west, where it rises some forty miles away from Lake Attikopi, in a number of small lakes whose discharges interlock streams flowing into the Peribonka and Outardes rivers, with the head-waters of the Manicouagan River. This stream was explored for twenty miles above its outlet, to where a small tributary passes into Lake Kitchewapistoakan, on the portage-route past the unnavigable portion of the Mouchalagan River. For this distance the stream flows in a channel about one hundred feet wide, generally with a sluggish current, except at short rapids which occur at frequent intervals. The channel is very crooked, and the banks seldom show solid rock, being for the most part composed of sand and generally low. The main direction of the stream is determined by sharp irregular ridges of sand, which bound its western side. These ridges are nearly continuous and where they are cut by the river, show the false-bedded structure of an esker, or deposit

Lake Attikopi

South-west
branch.

Great esker
ridge.

formed by a river flowing in or under the ice-sheet. This great esker was traced for more than twenty-five miles beyond Lake Attikopi toward the north-east, while in the opposite direction, according to the Indians, it extends almost to Lake Pletipi on the Outardes River, or a total distance of nearly one hundred miles. It is a marked physical feature in its south-western half, where it traverses wide swamps, and is used as a highway by the Indians in their winter travel. On the east side of the river, the country is covered with low, drumlin ridges of coarse till.

Highest area
of central
Labrador.

From the above description, the general surface of the country surrounding the river will be seen to be low and nearly flat, and it is only broken by occasional isolated rocky hills that rise from 200 to 400 feet above the general level. According to the Indian guide, the upper, unexplored portion of the river preserves the same character, flowing nearly on the surface of a wide swampy plain broken only by the esker ridge and by a few low drumlins. This plain extends northwards about ten miles to the foot of a high range of barren hills that rises 500 to 1000 feet above its level, and constitutes the highest area of central Labrador, being about 2400 feet above sea-level, forming the watershed between the Big River of Hudson Bay and the rivers flowing into the St. Lawrence.

Attikopis
Branch.

• The Attikopis Branch flows from the north-east, where it takes its rise in Lake Attikopi, or Little Attikopi, some twenty miles from the larger lake. The smaller lake is less than three miles long, and is divided by two narrows; it is chiefly of importance on account of two portage-routes which join here. One, from the westward leads to Nichicun, the other to Summit Lake. The Attikopis River, below the lake, flows in crooked courses in a wide valley bounded by rounded, rocky, isolated hills on the east side and by the higher range of granite hills on the west. Two spurs of this range rise close to the river. The valley is broken by low boulder ridges, with extensive swamps and small lakes between them. This country is partly covered with small, stunted black spruce and a few larches, while the hills are almost wholly barren. The river-channel is very irregular and occupies the depressions between the drift ridges. It practically consists of narrow lakes, connected by short rapids, where the channel is lined with boulders. Before reaching Lake Attikopi, it passes through a lake three miles long and about one mile wide, below which a mile of rapids and strong current leads to the large lake. Little Attikopi Lake is fed by two large brooks, both of which head in the mountainous country westward of Summit Lake. The portage-route follows the the eastern stream, almost due east, for six miles by its winding chan-

nel, to a lake about two miles across, surrounded by high, rugged, barren hills. Above this lake the stream is too small for canoes, and portages are made along it between the three small lakes at its head; these portages are respectively one-half, two, and one mile long. The portage over the watershed, between this stream and one flowing into the main branch, is about a mile and a half long and passes over a ridge between high, rugged hills, which surround the route. These hills are semi-barren, and the country has a very rough, desolate character.

Four small ponds, connected by a little stream, lead into a larger lake, about four miles long, the discharge of which is navigable with canoes, and, in a mile and a half to the next lake, it is broken by several rapids. This lake is a mile long and empties by a short rapid into Spruce Mountain Lake, which is four miles across to its southern angle, where it discharges. A narrow bay runs up a deep valley to the northward, and the lake is filled with islands and surrounded by high hills. The discharge is characterized by heavy rapids for two miles, to where it enters Itomamis Lake.

Portage-route between Lake Attikopis and Nichicun.

The portage-route to Nichicun leaves Lake Attikopis by its western tributary, which is ascended for about one mile; then a portage of over a mile leads to a little lake that empties into the small river. From this little lake two portages of a mile and a half mile respectively, with a small pond between them, end in a narrow lake, one mile long, connected by a short portage with a larger irregular lake, nearly three miles long. The general direction of this portion of the route is almost due west, and is through a wide valley surrounded by barren, rocky hills, from 300 to 600 feet high. The only trees seen skirt the lakes or grow in the swamps, the remainder having been destroyed by fire, leaving exposed low hummocks of drift thickly strewn with boulders. A portage of a quarter of a mile crosses the watershed and ends in a small lake drained by a tributary of the Big River. The direction of the route now changes to nearly south-west, for nine miles, as it passes first through a lake two miles long, connected with the next by a river stretch of one mile, with three portages past rapids, followed by a lake for five miles and another river stretch of a mile, with several rapids. A change of direction next occurs to west-north-west for the next twenty-four miles, along which course the stream passes through seven small lakes, and is greatly augmented by the junction of small branches from the lakes that partly fill the surrounding valleys.

Route to
Nichicun.

Lake Naokokan.

Between each lake there are heavy rapids, so that the large lake, called Naokokan, into which the river empties, is some 200 feet below the level of the lake at the watershed, or nearly 1800 feet above the sea. The country surrounding the river is rough, but the rocky hills near the valley die away to the south and west as Naokokan is approached. Recent fires have destroyed the greater part of the small stunted, black spruce and larch, which partly covered the lower lands. Naokokan is a large, irregular lake, nearly covered with islands and deeply indented with bays. Its greatest length, of thirty miles, is from east to west, while its width appears to be nearly twenty miles. From an elevation of 300 feet, near the mouth of the river, the lake had the appearance of a wide plain covered with numerous small lakes, and it was found only on passing into the lake that these numerous small lakes were really connected by straits and passages. Three days were spent in examining the southern shore of the lake in search of its outlet, and in that time only one of the deep western bays was explored. Owing to unfavourable weather—heavy south-west gales, accompanied by rain and fog,—and failing supplies, the exploration was ended here, without the outlet being found and descended to Nichicun. It has since been learned that the outlet is somewhere near the north-east angle of the lake, and that along it the distance to Nichicun is not more than twenty-five miles.

A large branch was discovered, falling with heavy rapids into the south side of the lake. This is the main stream of the Nichicun River, and takes its rise in a number of small lakes to the south, along the northern slopes of the mountains forming the watershed between it and the Manicugan, Outardes and Peribonka rivers. South and west of Lake Naokokan, there is a wide, flat plain, broken only by small isolated hills, and covered with innumerable lakes; to the north and north-east, the high mountains of the vicinity of Nichicun are seen with their rugged barren tops.

Portage-route used in Ascending the Mouchalagan River.

As previously stated, a portage-route leaves the west bank of the Mouchalagan River, about twenty-five miles above Mouchalagan Lake. A description of this route is intelligible only by reference to the map, as it follows a succession of portages joining little lakes and streams that lie in small valleys between the hills of the table-land, high above the level of the river-valley. The first portage is a mile and a quarter long. It leaves the river immediately above the mouth of a small stream and follows up its valley to a little lake on the table-land 620

feet above the river. There is a very marked change in the size and variety of forest trees between the ends of the portage. At the river there is a dense growth of medium-sized, black and white spruce, balsam fir, Banksian pine, larch, white birch and aspen, while, about the small lake above, only stunted black spruce and Banksian pine separated by open glades, are found together with a few larch about the swampy margin of the lake.

Crooked courses for two miles lead to the west end of the lake, whence a portage of half a mile, then a pond, followed by a portage of a mile, lead to a chain of very small lakes, on the head-waters of the stream, at a level 200 feet above that of the lower lake. Three small lakes joined by rapids follow, to a portage one-third of a mile long, through a swamp, ending in a narrow, crooked stream which is ascended about a mile and then left by another swampy portage half a mile long, crossing the watershed between tributaries of the Manicouagan and Outardes rivers at an elevation of 1680 feet above sea-level, or 770 feet above the river at the commencement of the portage-route. The country surrounding the route is rolling, being broken by short, isolated ridges of rounded hills, that rise from 100 to 400 feet above the water level. Wide valleys lie between the hills, covered either with small lakes or swamps, and with frequent low ridges of boulders rising above the level. The soil is scanty, and everywhere boulders and large angular fragments of rock are scattered in profusion, so that there is no difficulty in walking in any direction over the higher ground without stepping off these, while in the swamps the portage roads frequently lead along ridges of packed fragments, without any fine material between, and only partly covered with a deep coating of sphagnum, or white moss. The trees growing on this poor soil are small and stunted, and over ninety per cent are black spruce, with only a few groves of Banksian pine and small larch in the swamps.

Character of
the country.

From the height-of-land portage, the route for five miles follows a small stream connecting four little lakes, with short portages between them, and so reaches Little Matonipi Lake, about four miles long and a mile and a half wide, studded with many small, rocky islands. A portage of a mile and a half leads from near the discharge, at the north-west corner of the lake, to the eastern bay of Matonipi Lake. This bay is about two miles long, and from its mouth a northern bay extends four miles to its head, where the portage-route leaves it. Another long bay extends southward several miles, with a small river flowing out of its head, to join the Outardes River some twenty miles below the outlet of Lake Pletipi. The lake averages a mile in width, and is surrounded by rocky hills that rise

Matonipi
Lake.

in rounded outline from 200 to 500 feet, those on the west side being the highest. This western ridge is only a few miles across, and an old portage-route leads over it to Lake Pletipi, some fifteen miles away.

The direction of the portage-route to Lake Matonipi has been nearly due west. It now changes to north, and continues near that course until it reaches the south-west branch of the Attikopi River. The surface of the lake is 1640 feet above sea-level. The next lake at the upper end of the portage is two miles distant from the north end of Matonipi; it is about three-quarters of a mile across, and 270 feet above Matonipi.

From this lake another portage of two miles leads over a barren, rocky ridge thickly strewn with boulders, into a narrow gully filled with small ponds, connected by a brook which discharges into Lake Matonipi. The rise on this portage is 350 feet. The route continues up the gully, and passes in the next four miles through five ponds, with intervening portages, to the height-of-land between the waters of the Outardes River and a small branch of the Mouchalagan River, at a height of 2390 feet above sea-level, and one of the highest water summits of the Labrador peninsula.

The portage over the summit is more than a mile long, and passes between low, rounded, rocky hills, covered with blocks and boulders, and ends in a small swampy lake, out of which issues a stream too small to be descended by canoes.

Two miles of portage, over boulders and through swamp, lead to the junction of this stream with a somewhat larger one. The portage here crosses to the west bank, and for two miles and a half farther, follows down stream, on the summit of a narrow esker of stratified sand.

At the lower end of the portage, the stream is about twenty-five feet wide, but soon increases to fifty feet, below a small north branch, where it has a shallow channel, sandy bottom and sluggish current. This stream was followed for three miles and a half, and then left by a short portage to a pond, followed by another portage of half a mile to a small lake without any outlet. From this lake a three-mile portage leads northward to another pond connected with a small lake by a portage of half a mile. A similar portage leads from this to a larger lake, which is followed northward three miles to its end. This lake empties by another branch into the main river. The next three miles are occupied by five portages, which pass up a shallow valley, surrounded by drumlin hills of coarse drift, and containing five small ponds. The next lake is two and a quarter miles long, and is left by a half-mile

portage, ending in a small lake-expansion of the discharge of that lake. The discharge is followed for a couple of miles, and then a small branch is ascended a short distance, to a portage of a quarter of a mile, past rapids, to a small lake above. Five portages connecting ponds occupy the next threemiles; then a small stream is reached and descended for about one mile, after which a two-mile portage leads to a pond connected by a short portage with a lake nearly two miles long, from which a portage of a half-mile leads to Lake Kichewapistoakan on a small stream flowing into the south-west branch of the Attikopi River already described. This lake is of no great size, and is broken into deep irregular bays by low points of drift and rock. It is chiefly remarkable, on account of its possessing two discharges, both of which enter the valley of the main river within a short distance of each other. In the spring, when the Attikopi branch is in freset, its water backs into the lake, and flows out by the second outlet, which at ordinary times is nearly dry.

South-west
Branch, Atti-
kopi River.

The country and timber from the watershed to this place is similar to that already described. The only difference being the increase of drift on the northern slope, in the form of till and sand or esker-like deposits. The only trees are black spruce along with a very few larch, and all are stunted and confined to the valleys.

GEOLOGY.

The following notes on the various geological formations of the Labrador Peninsula are the result of observations made along widely separated lines of exploration in that great territory, and the time given to the work was very limited. It will thus be understood that they afford only the means of making a rough estimation of the distribution and extent of the areas of the different rocks, with some general remarks on their relations, modes of occurrence and age, together with a more or less detailed statement of the various exposures of rock actually examined along the routes followed.

Source of in-
formation.

The descriptions of the different rocks are from observations made in the field, together with a microscopic examination of the hand specimens brought back. It is to be regretted that circumstances prevented more than a small number of microscopic sections being made. These have been examined by Mr. W. F. Ferrier and described in Appendix V.

GEOLOGICAL FORMATIONS.

The term Laurentian is employed to designate the complex mass of Laurentian highly crystalline Archæan rocks of which the greater part of the

Labrador Peninsula is composed. These do not differ in any essential particulars from those similarly designated in other parts of Canada. They consist chiefly of gneisses and schists, some of which are believed to be highly metamorphosed materials of clastic origin, while others are regarded as foliated eruptives. As it is not possible, except in limited areas, to separate these rocks on the map, they are necessarily treated together.

The rocks of clastic origin are in nearly all cases the most ancient. The age of the areas of irruptive rocks is not known definitely, but many of them are very ancient, as fragments from them are included in the conglomerates of the Huronian. Others closely resemble the basic irruptives found cutting the Cambrian strata, and possibly are newer than that bedded series. These basic irruptives are in turn cut by later intrusions of granite, so that if the former are post-Cambrian some of the latter may be high up in Palaeozoic time. Where the age of these rocks can be determined by their intrusion into the bedded series of the Huronian or Cambrian, they have been separated from the rest of the complex, and the remainder grouped under the name Laurentian until more evidence is obtained as to their exact age. It may be taken for granted, however, that by far the greater portion of the irruptive rocks included in the Laurentian are extremely ancient, and that the areas of those supposed to be post-Cambrian are unimportant compared with the areas of rocks long antedating that formation.

Huronian. Under the name Huronian are included several widely separated areas of clastic and volcanic rocks, together with many basic eruptives; these are represented by various schists, conglomerates, breccias, diorites and other rocks more or less interfolded with the Laurentian.

Cambrian. The Cambrian rocks rest unconformably upon the Laurentian and Huronian, and are made up of bedded sandstones, argillites, shales and limestones, along with bedded traps and other basic intrusive or volcanic rocks. More detailed descriptions of the Huronian and Cambrian rocks are given under their respective headings.

Great lapse of time between Huronian and Cambrian. The Laurentian and Huronian gneisses and schists are intensely folded. This folding took place long previous to the deposition of the sedimentary beds of Cambrian age; and a sufficiently long time had elapsed between the period of folding and the Cambrian submergence, to allow for great removal of material by denudation and for the main sculpturing of the peninsula. The Cambrian rocks are found flat-bedded in the valley of Hamilton Inlet, and extend fifty miles up the Hamilton River; they are also found resting almost undisturbed in the great basins of Mistassini and Michikamau lakes. These examples

APPENDIX I:

LIST OF MAMMALIA OF THE LABRADOR PENINSULA, WITH SHORT NOTES ON THEIR DISTRIBUTION, ETC., BY A. P. LOW.

The following notes on the habits and range of the mammalia of Labrador, as far as refers to the interior, are largely the results of observations and information obtained during the recent explorations:—

Lynx Canadensis, Desmarest (Canada Lynx, Mountain Cat).—The lynx is commonly found within the wooded area, from the Atlantic coast to Hudson Bay. During the winter of 1893, many skins were taken in the valley of the Hamilton River. The number is said by the Indians and traders to vary with that of the rabbits which form the natural food of the lynx. When the rabbits are dying off after seasons of plenty, the Indians all say that the lynx does not breed, and only when the rabbits are again becoming plentiful do they again produce young. These animals are generally caught in dead-falls placed at the mouths of hollow logs.

Canis lupus, Linn. (Wolf).—The wolf is seldom met with in the southern regions since the extermination of the caribou there. It is now found only in the barren and semi-barren lands, where the caribou are still plentiful. A wolf was seen at the post at Northwest River, and a single skin was seen in the possession of an Indian on the upper Hamilton River; the animal had been shot near Lake Michikamau. On the Hudson Bay coast, wolves were formerly plentiful, but of late years are quite rare.

Canis lupus, var. *albus*.—The White or Arctic Wolf is occasionally taken in the barren grounds, but does not appear to enter the timbered regions of the interior.

Canis familiaris, Say.—The Eskimo Dog is common along the coast everywhere, but south of Sandwich Bay the breed is much mixed. This animal plays an important part along the coasts, being used in the place of horses, or other animals for hauling. The methods of attaching the dogs to the sleds is different from that employed in the west, each dog having an independent trace, so arranged in length, that when the dogs are in line each one falls in behind another. The number of dogs in a team varies from four to thirteen. They are extensively used by the Eskimo and resident whites in

travelling about the coast, and also for hauling wood, water and other loads. On ordinary 'roads' each dog will haul about 100 pounds, but when travelling on the crust, in the spring time, the load can easily be doubled or trebled.

Vulpes vulgaris, Fleming (Red, Cross, Silver and Black Fox).—These different animals are only colour varieties of the same species. On the Moose River, in 1887, the writer found a litter containing seven kits; of these two were red, three were cross and the remaining two black or silver—thus showing that the colour of foxes no more constitutes varieties than does the difference of colour in a litter of kittens of the common cat. There appears to be a greater proportion of dark-coloured foxes in the northern region than in the southern. The fox is found throughout Labrador from the St. Lawrence to Hudson Strait, where it is taken in the barrens and along the coast by the Eskimo. Most of the skins are taken before Christmas, as the fur becomes poor early in the spring.

Vulpes lagopus, Linn. (Arctic Fox, White Fox) is found most abundantly in the barren grounds. It is taken rarely south of Lake Michikamau or Nichicun. Along the seaboard the white fox ranges farther south, descending to the southern part of James Bay, and on the Atlantic coast being plentiful about Hamilton Inlet, but more rare southward to near the Strait of Belle Isle. Most of the foxes along the southern Atlantic coasts are said to be migrants from the northern coasts, and they are rarely caught south of Hamilton Inlet before that body of water is frozen over. The blue fox (var. *fuliginosus*) is much less abundant than the white, with which it is found. It is very rare along the southern half of the Atlantic coast.

Mustela Americana, Turton (Sable, Pine Marten).—The marten is one of the most abundant and valuable fur-bearing animals of Labrador. Its northern range is practically limited to the southern boundary of the semi-barrens, and it is found only in the wooded stretches of the river-valleys north of this line; north of the Big and Hamilton rivers, it is rarely found. The largest and darkest skins are taken along the edge of its northern limits, and on this account the skins bought at Fort George, Nichicun, Fort Chimo and Northwest River are much more valuable than those procured at the southern posts. The marten hunt is made after the smaller lakes set fast until December, and again during the months of March and April, after which the skins become poor.

Mustela Pennantii, Erxleben (Fisher, Pekan).—This animal only rarely enters the south-west limits of Labrador, not being known to occur east of Mingan, or north of Mistassini.

Putorius vulgaris, Linn. (Weasel).—Common everywhere south of the tree limit.

Putorius ermineus, Linn. (Ermine).—Common everywhere throughout the wooded regions.

Putorius vison, Brisson (Mink).—The mink is limited to the southern part of Labrador, and is only rarely found north of the East Main and Hamilton rivers. Not a single specimen was seen on the upper Hamilton River during the summer of 1894, and the Indians of that locality report it as rare. It is common on the lower river and about Hamilton Inlet. Several specimens were taken on the upper East Main River, but it is rare about Nichicun.

Gulo luscus (Linn.) Sabine (Wolverine, Carcajou).—Abundant throughout Labrador, especially in the northern portions, where it is taken by the Eskimo as far north as Hudson Strait. This animal is the personification of the devil among the Indians, owing to its cunning and destructive habits. Every Indian has wonderful stories to relate about the ferocity and intelligence of the wolverine. No cache of provisions or outfit is safe from the attacks of these animals, unless built up from the ground on high posts, in such a manner that the floors project and prevent the animals from reaching the sides or top. When a wolverine breaks into a cache, it not only eats the provisions, but breaks up and destroys other articles not fit for food. A wolverine in the vicinity of an Indian's hunting grounds, proves a very disagreeable neighbour, from its habits of following the hunter's tracks and either springing his traps and removing the bait, or else devouring the martens and other animals already caught. The wolverine is seldom caught itself, as its cunning is sufficient, after it has lost a few claws in the traps, not to put its feet in the set traps without first springing them by moving them about. When caught, they frequently gnaw off their foot above the trap and leave it, at other times they depart, taking trap and chain with them. In the fall of 1893, a wolverine carried away a trap from the Northwest River, and was taken a few days later in another trap on the Hamilton River, some thirty miles away from the place where it had picked up the first trap. The reason it was taken in the second trap, was because it could not obtain food while dragging the trap and chain through the bush, so, being reduced to starvation and hampered by the trap attached to its front leg, it was not able to spring the second one without being caught.

Mephitis mephitis, Shaw (Skunk).—Stearns says that it is rarely seen on the southern coast.

Lutra Canadensis, Turton (Otter).—The otter is common throughout the wooded region and ranges northward into the barren grounds. The skins taken in the northern regions have the darkest and most glossy fur. Very abundant on the upper Hamilton River, especially in the vicinity of the Grand Falls, where a number of Indian families congregate in the spring to hunt it.

Ursus arctos, Richardson (Barren-ground Bear).—There is no doubt that this species is found in the barrens of Labrador, as skins are brought in at intervals to Fort Chimo, and the Nascaupsee Indians have numerous tales of its size and ferocity.

Ursus Americanus, Pallas (Black Bear).—The wooded country is the northern limit of this species, and it is most abundant in the southern regions in the burnt districts. Specimens were seen on the East Main River and about the Grand Falls on the Hamilton River. About Lake Winokapau and the lower Hamilton River bears are numerous. At Cambrian Lake, on the Koksoak River, the tracks of a large bear were seen along the shores, but it is not known whether these were those of a black bear or a barren-ground bear.

Thalassarcos maritimus, Linn (Polar Bear).—This species is as a rule confined to the coast and rarely travels inland, except to produce its young. At such time it is met with from twenty-five to fifty miles from the coast. On the Atlantic coast it is occasionally found as far south as the Strait of Belle Isle, whither it is carried from the north on ice floes. North of Hamilton Inlet, it is frequently met with along the coast and on the islands, being common about Cape Chidley and along Hudson Strait. During the winter of 1894 the tracks of three white bears were seen close to Northwest River, at the head of Hamilton Inlet, and a few specimens have been killed in that locality. In Hudson Bay, the white bear ranges southward to Charleton Island, near the south end of James Bay, in latitude 52°.

Odoboenus rosmarus, Malmgren. (Walrus).—This species, once common along the entire Labrador coast and the Gulf of St. Lawrence, is now found only on the Atlantic coast about and to the northward of Nachvak. It is common at all seasons in Hudson Strait, and along the northern Hudson Bay coast. Large numbers are killed by the Eskimo on the chains of outer islands which stretch southward to opposite Little Whale River off that coast.

Phoca vitulina, Linn. (Harbour Seal, Fresh-water Seal).—Common to the coast and low parts of the rivers all round Labrador. There are two or three large lakes inland near the head of the Stillwater Branch of the Koksoak River, but probably drained by the Nastapoka

River into Hudson Bay, where seals are reported by the Indians as plentiful. Another large lake inhabited by seals, is situated at the head of the north branch of the Northwest River, which flows into Hamilton Inlet. Skins in possession of the Indians, taken from these lakes, show that the seals belong to this species. According to the Indians, these animals never leave the lakes, and consequently have acquired a fresh-water habit.

Phoca foetida, Fabricius (Ringed Seal).—Along the whole Labrador coast. Commonest species in the Hudson Strait, and the principal food of the Eskimo.—(Tyrrell.)

Phoca Groenlandica, Fabricius (Harp Seal).—Very abundant along Labrador coast. Common on south shore of Hudson Strait. Common in Hudson Bay.

Erignathus barbatus, Fabricius (Bearded Seal, Square-flipper).—Rare on the St. Lawrence and southern Labrador coasts. Common about Nachvak, where the dog traces made from this skin are obtained for the southern Hudson's Bay Company's posts. A large specimen was seen at the head of tide, some sixty miles above the mouth of the Koksoak River. Common in Hudson Strait and Hudson Bay. Numbers seen about the Twin Islands in James Bay. Specimen obtained at the mouth of Moose River by Dr. R. Bell.

Halicherus grypus, Fabricius (Gray Seal).—Rare along Atlantic coast, Hudson Strait and Hudson Bay.

Cystophora cristata, Erxleben (Hooded Seal).—Not common along the coasts of Labrador.

Delphinopterus catodon, Linn. (White Porpoise, White Whale).—Found everywhere along the coasts of the Labrador Peninsula from the St. Lawrence to the southern extremity of Hudson Bay. Fisheries for these animals are established in the mouths of the Koksoak, Leaf and Whale rivers flowing into Ungava Bay, and were formerly carried on at Great and Little Whale rivers on Hudson Bay. The whales are driven, as they ascend the river at high tide, into ponds inclosed by strong nets, and when the tide goes out they are either speared or shot in the shallow water.

Monodon monoceros, Linn. (Narwhal).—The "horns" of these animals are frequently brought to the Hudson's Bay posts by Eskimo from Hudson Strait and the north part of Hudson Bay.

Alce Americanus, Jardine (Moose).—It is very doubtful if this species enters the south-west limits of Labrador from the head-waters of the Ottawa River, where it is found abundantly.

Rangifer caribou, Linn. (Woodland Caribou).—Within the past twenty-five years the woodland caribou was plentiful throughout the southern wooded region, but now is practically exterminated on the southern watershed, being met only in small numbers about the heads of the rivers flowing into the eastern part of the Gulf of St. Lawrence. In 1892, along the route from Lake St. John to Mistassini, and from there to the mouth of the East Main River, not a single deer track was seen. In 1885, the last herd of seven caribou was killed in the vicinity of Lake Mistassini. A few woodland caribou are annually killed about the head-waters of the East Main River and Nichicun post. On the upper Hamilton River this species is still met with in small bands, but, according to the Indians the numbers at present killed are only a small percentage of the numbers annually slaughtered a few years past. This extermination of the caribou is very detrimental to the interior Indians, who in former times depended largely upon them both for food and clothing. Notwithstanding the quantity of flour now brought inland, and the fish caught and preserved for winter use, cases of starvation are of annual occurrence from the lack of animal food in place of the deer meat. In 1892, a deserted camp where a dozen persons had died of starvation two years previously, was passed on the East Main River. The survivors—a woman and a boy—told the usual tale of failure to find deer and consequent starvation. There appears to be no remedy for this except the abandonment of the interior by a large proportion of the Indians, with the total suppression of caribou hunting for a number of years. This is probably not practicable, and the Indians of the interior will consequently, it is feared, continue to die off.

The astonishing rate at which the fur-bearing and other animals multiply when undisturbed, was noted along the East Main River, where, owing to the death of Indians above mentioned, no hunt had been made for two years—and in that short interval the beavers had overstocked the small streams, and were common all along the main river.

Rangifer Groenlandicus, Linn. (Barren-ground Caribou, "Reindeer").—This species ranges in immense herds over the barren and semi-barren grounds. On the Atlantic coast, caribou of this variety are found south to the Mealy Mountains, a high barren range between Hamilton Inlet and Sandwich Bay. To the northward they are more or less common and at certain seasons of the year very plentiful about Davis Inlet and Nain. On the Hudson Bay coast they were formerly very abundant as far south as Cape Jones or the mouth of James Bay, but of late years they are found only in small numbers north of Great Whale River.

From information obtained from the Nascaupsee Indians and others, the reindeer is believed to spend the summer season on the barren highlands near the coast, where the strong breezes keep down the pest of flies. In the autumn they migrate inland and southward into the semi-barrens, returning to the true barrens again in the months of April and May. In the northern part of the peninsula there appear to be three distinct herds, one on the Atlantic coast, that passes the summer on the highlands between Nachvak and Nain; a second, which crosses the lower part of the Koksoak River and summers on the west side of the Ungava Bay and Hudson Strait; and a third, which passes northward from the vicinity of Richmond Gulf and Clearwater Lake, and summers along the highlands of the north-east coast of Hudson Bay. Of late years, this last herd has become very small, and many of the Indians who lived on it have migrated from Hudson Bay to Fort Chimo, while the second herd was undiminished. The first herd supports the Indians living on the George River, and almost all from the Hamilton River. The principal hunt is made during the fall migration, when the bucks are fat and have not yet mated with the females. The Indians congregate along the George River, about a hundred miles beyond Lake Michikamau. They spread out along the river and await the crossing of the bands of deer on their way from the coast to the wooded country. As soon as a large body begins to cross, signals of smoke are made, and the Indians soon congregate and kill great numbers from their canoes by spearing them while in the water. The season for crossing lasts from ten to fifteen days. Much of the flesh is smoked for winter use, while the skins are preserved and dressed, either for clothing and other purposes or for sale. In the spring the deer migrate in small bands and are not so easily taken, as the snow and ice are then beginning to melt and they have to be killed by shooting after a chase. The migration of the second band is similar to that already described, except that during the fall migration small herds are continually crossing backwards and forwards along the river. Wide paths, caused by a single passage of the deer, were met with along the Koksoak River as far south as Cambrian Lake, and smaller paths as far as Lake Kaniapiskau, where a small number of the reindeer appear to remain throughout the summer. A couple of large paths were found on the Ashuanipi branch of the Hamilton River, and in the spring a number of tracks, made by small herds, were encountered below the Grand Falls. Periodically, the reindeer omit to return to the wooded areas from the barrens, and when this happens the Indians depending on them are left in a most lamentable condition, being largely without food and clothing. Many die of starvation in consequence unless outside aid is given. The

death of over 150 persons along the Koksoak River during the winter of 1893, is but one of several such calamities which have happened during the last fifty years. In the evidence given before the committee of the Hudson's Bay Company, 1851, a letter was read from Wm. Kennedy as follows: "Starvation has, I learn, committed great havoc among our old friends the Nascopies, numbers of whom met their death from want last winter; whole camps of them were found dead, without one survivor to tell the tale of their sufferings."

Ovibos moschatus, Zimmermann (Musk Ox).—There is no evidence to show that the musk ox was ever found in Labrador.

Vespertilio lucifugus, Leconte (Blunt-nosed Bat).—A small bat is common in the southern portion of the peninsula, having been seen on the Hamilton River and at Lake Mistassini, and it is supposed to be referable to this species.

Vespertilio subulatus, Say, is reported by Stearns from Natashquan.

Sorex personatus, Geoffroy St. Hilaire (*S. Cooperi*, Baird).—This small shrew was obtained at Sandwich Bay.

Sciuropterus volucella, Pallas, var. *Hudsonius*, Gmel. (Northern Flying Squirrel).—Common in the valley of the lower Hamilton River and about the head of Hamilton Inlet. Found at St. Augustine (Stearns).

Sciurus Hudsonius, Pallas (Red Squirrel).—Found throughout the southern wooded region as far north as the East Main River, and to the westward; on the Hamilton River from its mouth to Sandgirt Lake, and southward on the Attikonak Branch, but not along the Ashuanipi Branch.

Arctomys monax, Linn. (Woodchuck, Ground-hog).—Common in the country between Lake St. John and the East Main River, and on the Romaine River. Not seen on the Hamilton River, but said to be found about the head of Hamilton Inlet. "Common at Mingan, growing scarce towards Bonne Espérance" (Stearns).

Castor fiber, Linn. (Beaver).—Common in the wooded region and extending into the semi-barrens where food is found. On the Hudson Bay coast, rare north of Big River. In 1887 a specimen was killed in Richmond Gulf, latitude 56°. Charleton Island, in James Bay, was well-stocked with beaver introduced by the Hudson's Bay Company, but they were totally exterminated by wandering Eskimo in 1890. As before stated, beaver are very plentiful on the Lower East Main River. About Nichicun they are now more plentiful than formerly.

Common about the Lower Hamilton River and upwards to Sandgirt Lake, becoming very rare to the northward towards Lake Michikamau.

Hesperomys leucopus, Rafinesque (White-footed or Deer Mouse).—Common at Northwest River, Hudson's Bay post.

Arvicola riparius, Ord.—Specimen taken on Upper Hamilton River near Lake Petitsikapau. The Indians report a smaller species as not rare in the interior wooded country.

Cuniculus torquatus, Pallas. (Hudson Bay Lemming).—Common throughout the barren ground and southward to about latitude 54°. Specimen obtained from Lake Michikamau.

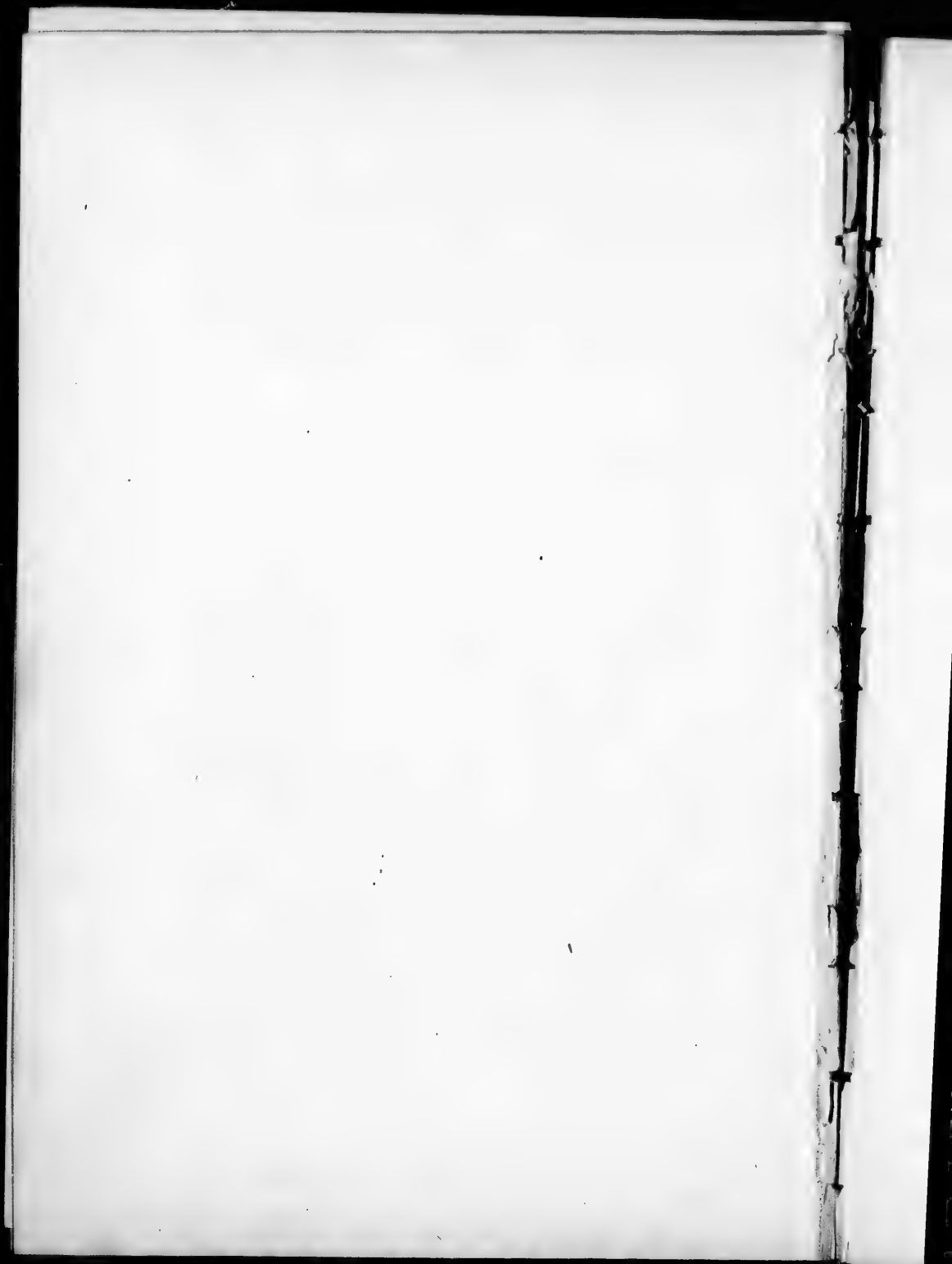
Zapus Hudsonius, (Zimmermann) Coues, (Jumping Mouse).—Not rare in the wooded region. Specimens taken at the mouth of the Hamilton River, near the Grand Falls, and on the Romaine River portages. The Indians who saw these specimens say that there is a much smaller species found in the interior, which closely resembles the larger, except in size.

Fiber zibethicus, Linn. (Muskrat).—Common in the southern-wooded region, but rare along the Upper Hamilton River.

Erethizon dorsatus, Linn. (Canada Porcupine).—Ranges from the St. Lawrence northward into the semi-barrens. Very plentiful along the Hamilton River, where it is largely used for food by the Indians. Common at Hamilton Inlet, and northward to Hopedale. Traces seen along the Great Whale River, and also on the Koksoak River, above Cambrian Lake.

Lepus timidus, Linn., var. *arcticus*, Leach. (Polar Hare).—Confined to the barren and semi-barren lands of Labrador. On the Hudson Bay coast a few are taken about Great Whale River. On the Atlantic they occur southward as far as Hamilton Inlet. A few are killed about Lake Michikamau.

Lepus Americanus, Erxleben (Hare, "Rabbit").—Found throughout the wooded region. Like the western rabbit, it is visited periodically with an infectious throat-disease, which about once in five years practically exterminates the animal. The disease apparently travels from the west towards the east and takes about two years to cross Labrador. The rabbit is largely used for food by the Indians, but is not sustaining, and they all say that on a diet of rabbits alone they rapidly become weak and unfit for work.



APPENDIX II.

LIST OF BIRDS OF THE INTERIOR OF THE LABRADOR PENINSULA.

Urinator imber, Gunn. (Loon).—Common throughout the interior; breeds.

Urinator lumme, Gunn. (Red-throated Loon).—Common on upper Hamilton River and Koksoak River; breeds.

Urinator arcticus, Linn.—Seen June 3rd at Lake Mistassini; not common.

Uria troile, Linn. (Murre).—Common in open water of Hamilton Inlet until January 20th, 1894.

Alle alle, Linn. (Dovekie).—Very common in Hamilton Inlet until January 20th, 1894. Numbers of this and the preceding found frozen in bushes along the edge of the open water.

Gavia alba, Gunn. (Ivory Gull).—Specimen obtained at Rigolet, where it was shot during the winter; seen at Northwest River late in December after the inlet was frozen; not common.

Larus glaucus, Brunn. (Glaucous Gull).—Common throughout the interior; seen May 19th; eggs June 14th.

Larus Delawareensis, Ord.—Nests at Mistassini Lake; seen June 11th.

Sterna Forsteri, Nutt. (Forster's Tern).—Common throughout interior; seen June 13th, Hamilton River, June 1st, Mistassini.

Merganser Americanus, Cass. (American Merganser).—Common throughout interior; seen May 28th; eggs June 25th.

Merganser serrator, Linn. (Red-breasted Sheldrake).—Abundant throughout the interior; seen May 28th; eggs June 25th.

Anas obscura, Gmel. (Black Duck).—Not common throughout the interior; seen May 1st; eggs May 23rd.

Glauionetta clangula Americana, Bp. (American Golden-eye).—A few flocks seen on upper Hamilton River during June; seen at Mistassini May 3rd.

Somateria spectabilis, Linn. (King Eider).—One specimen killed at Lake Mistassini.

Oidemia Americana, Sw. and Rich. (American Scoter).—Common on Hamilton River, May and June, in migration; seen May 26th.

Oidemia perapicillata, Linn (Surf Duck).—Common on Hamilton River during migration, May and June; seen May 26th.

Branta Canadensis, Linn. (Canada Goose).—Breeds in marshes throughout the northern interior, and is seen along the rivers with young broods about July 1st; seen at Mistassini May 2nd, at Grand Falls, Hamilton River, May 4th. From the journals of the Hudson's Bay Company, the average date of first arrival at Lake Winokapau and Northwest River, is May 10th; several large broods seen on Burnt Lakes, Romaine River; not common at Lake Mistassini, but abundant on East Main River—especially on lower part, where the river is cut out of clays, with good bottom-lands; breeds in large numbers on the islands of James Bay.

Branta bernicla, Linn. (Brant).—Very rare in the interior; one sick killed at Mistassini July 2nd. If these birds cross Labrador in their northern migration, they fly high and only rarely rest, as the Indians, who know them well on the St. Lawrence coast, report them very rare in the interior.

Nycticorax nycticorax naevius, Allen (Black-crowned Night-Heron).—Single specimen at Lake Mistassini, August 6th.

Phalaropus lobatus, Linn. (Northern Phalarope).—Seen on upper Hamilton River, June 13th. Not common.

Gallinago delicata, Ord. (Wilson's Snipe).—Male heard and seen at Lake Petitsikapau, Hamilton River, June 28th.

Tringa minutilla, Vieill. (Least Sandpiper).—Common about Upper Hamilton River. Breeds.

Totanus melanoleucus, Gmel. (Greater Yellow Legs).—Met with occasionally throughout the interior. Breeds. Seen May 31st.

Totanus flavipes, Gmel. (Yellow Legs).—Seen only after August 1st, on Hamilton River and at Mistassini.

Totanus solitarius, Wils. (Solitary Sandpiper).—Common throughout the interior, especially south of latitude 54°. Breeds. Seen May 27th. Eggs June 19th.

Actitis macularia, Linn. (Spotted Sandpiper).—Common along the upper Hamilton River. Seen May 27th. Eggs June 20th.

Egialitis semipalmata, Caban. (Semipalmated Plover).—Common on Upper Hamilton River. Seen June 16th. Breeds.

Dendragapus Canadensis, Linn. (Canada Grouse, Spruce Partridge).—Common throughout wooded and in the semi-barrens. Eggs June 1st.

Bonasa umbellus togata, Linn. (Ruffed Grouse, "Partridge." Birch Partridge).—Common at Mistassini. Not rare at mouth of Hamilton River. Not found on Upper Hamilton River.

Lagopus lagopus, Linn. (Willow Ptarmigan).—Common throughout the winter. Breeds on Upper Hamilton River. Eggs June 25th.

Lagopus rupestris, Gm. (Rock Ptarmigan).—Common in valley of Hamilton River during winter. Leaves for northward about April 15th.

Ectopistes migratorius, Linn. (Passenger Pigeon).—Very rare. Eggs obtained at Fort George, 1887.

Accipiter atricapillus, Wils. (American Goshawk).—Specimen killed near Cambrian Lake, Koksoak River; also on lower Hamilton River. Not common.

Aquila chrysaetos, Linn. (Golden Eagle).—Breeds at head of Lake Michikamau. Seen in several places along upper Hamilton River.

Halidetus leucocephalus, Linn. (Bald Eagle).—A pair seen on Hamilton River below Grand Falls, April 28th. White heads distinctly seen.

Falco rusticolus obsoletus, Gmel. (Labrador Gyrfalcon).—Specimen shot at Cape Chidley.

Falco peregrinus anatum, Bon. (Duck Hawk).—Not uncommon throughout the interior.

Pandion halidetus Carolinensis, Gm. (Osprey).—Common throughout southern interior, to lat. 54°. Seen May 27th. Eggs June 12th. Nest on top of large white spruce.

Asio accipitrinus, Pall. (Short-eared Owl).—Seen on Upper Hamilton and Romaine rivers.

Nyctale Acadica, Gmel. (Saw-whet Owl).—Specimen shot near Lake Mistassini.

Bubo Virginianus saturatus, Ridgw. (Dusky Horned Owl).—Common about Northwest River during winter. Common in the interior.

Surnia ulula caparoch, Müll. (American Hawk Owl).—Seen several times on Upper Hamilton River.

Ceryle alcyon, Linn. (Belted Kingfisher).—Was not found north of the vicinity of the Grand Falls, Hamilton River. Common on Romaine River and at Lake Mistassini. Seen May 30th.

Dryobates villosus leucomelas, Bodd. (Hairy Woodpecker).—Shot in valley of Hamilton River in March. Not rare.

Dryobates pubescens, Linn. (Downy Woodpecker).—Common on Hamilton River throughout the year.

Picoides arcticus, Swains. (Black-backed Three-toed Woodpecker).—Common along Lower Hamilton River.

Colaptes auratus, Linn. (Yellow-shafted Flicker).—Single specimen seen near Grand Falls, Hamilton River, 30th May.

Chordeiles Virginianus, Gmel. (Night-hawk).—Very rare on Upper Hamilton River. Single specimen seen near the Grand Falls, May 31st. Common at Mistassini and along Romaine River.

Empidonax flaviventris, Baird. (Yellow-bellied Fly Catcher).—Common at Lake Mistassini. Not seen at Hamilton River.

Otocoris alpestris, Linn. (Horned Lark).—Common on barrens of Upper Hamilton River and about Lake Michikamau.—Eggs June 19th.

Perisoreus Canadensis, Linn. (Canada Jay).—Very common throughout the interior. Nest with four eggs taken at Rigolet March 24th, 1894; and another at North-west River, with three eggs, about the same date. Young able to fly from nest on May 18th, at Grand Falls, Hamilton River.

Perisoreus Canadensis nigricapillus, Ridgw. (Labrador Jay).—Abundant throughout northern interior.

Corvus corax principalis, Ridgw.—Common throughout the interior. Resident.

Molothrus ater, Gray. (Cowbird).—Common at Lake Mistassini.

Scolecophagus Carolinus, Müll. (Rusty Black Bird).—Common throughout the interior.

Pinicola enucleator, Linn. (Pine Grosbeak).—Common on the Upper Hamilton River. Male seen May 1st.

Loxia leucoptera, Gmel. (White-winged Cross-bill).—Common on Hamilton River in March and April.

Acanthis linaria, Linn. (Common Redpoll).—Abundant about the Hamilton River.

Plectrophenax nivalis, Linn. (Snow Bunting).—Plentiful on Hamilton River in early spring.

Calcarius Lapponicus, Linn. (Lapland Longspur).—Common on Hamilton River in early spring.

Anmodramus Sandwichensis Savanna, Wils. (Savannah Sparrow).—Very common on upper Hamilton River. Eggs June 24th.

Zonotrichia Leucophrys, Forst. (White-Crowned Sparrow).—Very common on upper Hamilton River. Seen May 16th. Eggs June 25th.

Zonotrichia albicollis, Gmel. (White-throated Sparrow).—Common at Lake Mistassini. Heard at Grand Falls, Hamilton River. Common on the Romaine River.

Spizella monticola, Gmel. (Tree Sparrow).—Common everywhere in Labrador. Breeds in great numbers on upper Hamilton River. Seen May 31st; eggs June 21st.

Junco hyemalis, Linn. (Black Snow-bird).—Common at Lake Mistassini and upper Hamilton River. Seen May 29th. Eggs June 27th.

Melospiza fasciata, Scott (Song Sparrow).—Common at Lake Mistassini.

Tachycineta bicolor, Vieill. (White-bellied Swallow).—Common throughout the interior. Seen May 25th.

Ampelis cedrorum, Vieill. (Cedar Wax-wing).—Rare at Lake Mistassini.

Lanius borealis, Vieill. (Great Northern Shrike).—Common on Hamilton River; seen April 16th.

Helminthophaga peregrina, Wils. (Tennessee Warbler).—Not rare at Lake Mistassini.

Dendroica aestiva, Gmel. (Yellow Warbler).—Common at Lake Mistassini; seen near Grand Falls, Hamilton River, May 31st.

Dendroica coronata, Linn. (Myrtle Warbler).—Specimen from Grand Falls, Hamilton River, May 31st.

Dendroica maculosa, Gmel. (Magnolia Warbler).—Not rare at Lake Mistassini.

Dendroica striata, Forst. (Black-poll Warbler).—Common on upper Hamilton River. Seen May 31st.

Seiurus noveboracensis, Gmel. (Water Thrush).—Common about Grand Falls, Hamilton River. Seen May 31st.

Sylvania pusilla, Wils. (Black-capped Yellow Warbler).—Seen near Grand Falls, Hamilton River, May 31st. Not rare at Lake Mistassini.

Parus hudsonicus, Forst. (Hudsonian Chickadee).—Abundant on Hamilton River from April 1st.

Regulus satrapa, Licht. (Golden-crowned Kinglet).—Common on Hamilton River between Grand Falls and Sandy Lake; rare to northward; seen May 19th.

Regulus calendula, Linn. (Ruby-crowned Kinglet).—Very common along Hamilton River between Grand Falls and Sandy Lake. Seen May 29th.

Turdus ustulatus swainsonii, Caban. (Olive-backed Thrush).—Very common along the upper Hamilton River. Seen May 16th. Eggs June 30th.

Turdus Lionalaschke Pallasii, Caban. (Hermit Thrush).—Not rare at Lake Mistassini.

Merula migratoria, Linn. (American Robin).—Abundant throughout the interior. Seen May 10th. Eggs June 13th.

APPENDIX III.

LIST OF THE PRINCIPAL FOOD FISHES OF THE LABRADOR PENINSULA, WITH SHORT NOTES ON THEIR DISTRIBUTION.

Petromyzon (sp.).—A small Lamprey was taken on the Bersimis River a few miles below Lake Pipmaukin, 1884, adhering to a large brook trout.

Accipenser (sp.).—A species of Sturgeon is very plentiful in the Rupert River, being taken in large quantities at Lake Nemiskau, where the Indians congregate and dry the fish during September. The fish here are usually under three feet in length. Also abundant in the river from Lake Nemiskau to its mouth. Common in the East Main River, from its mouth to Conglomerate Gorge. Also found in the lower part of the George River and in the Nottaway at Lake Obatogaman, near its head.

Catostomus longirostris, LeSueur (Long-nosed Sucker, Northern Sucker).—Common in rivers and lakes throughout the interior. The principal food of the Indians in many parts of Labrador.

Catostomus Forsterianus, Richardson. (Red Sucking Carp, Red Sucker).—This is usually regarded as a variety of the above, but Sir John Richardson gives it as a distinct species, and the fish found in Labrador is quite distinct in shape, size of scales and colour, from the first-named sucker. It is at least two weeks later on the spawning beds. Common throughout the interior. Preferred by the Indians for food to the gray sucker. Average weight of both species about 5 pounds.

Osmerus mordax (Mitchill), Gill. (American Smelt).—Common at the mouth of the Northwest River, Hamilton Inlet, where it is abundantly taken in November and the early part of December.

Coregonus clupeiformis (Mitchill), Milner (Common Whitefish).—Found abundantly throughout the interior, in lakes and rivers. Largest fish taken in Lake Mistassini, 14 pounds weight. Average weight 3 or 4 pounds. A small species of whitefish closely resembling the common whitefish is caught in abundance in the shallow salt water along the east coast of James Bay. These fish ascend the rivers of James Bay during the autumn months along with sea trout.

Salmo salar, Linn. (Common Atlantic Salmon).—Abundant in the rivers of the St. Lawrence and the Atlantic coasts and also in the rivers

flowing into Ungava Bay. Reported by Dr. R. Bell, as taken by Eskimo at Stupart Bay, at the western side of Ungava Bay or Hudson Strait. The salmon enter the rivers of the St. Lawrence coast early in June, are taken in Hamilton Inlet in July, but do not ascend the Koksoak and other rivers of Ungava Bay until about the middle of August. From this there would appear to be some connection between the time at which the fish strike into the rivers and the temperature of the water along the coast, that to the northward rising more slowly than the southern waters; or else the fish follow northward along the coast and take at least two months to pass from the Strait of Belle Isle to Ungava Bay. There is no evidence, however, to show that the fish thus follow the coast. The time at which the salmon enter Ungava Bay from the Atlantic and the absence of this species from Hudson Bay, would seem to show that the waters of the western part of Hudson Strait do not rise sufficiently in temperature to allow the salmon to enter Hudson Bay in time to ascend its rivers before the spawning season, and this is the probable cause why no Atlantic salmon have been are found in its rivers.

The land-locked variety of *S. salar*, or ouinaniche, is found in Lake St. John and the tributaries of the Saguenay River, where it has free access to the sea, but as the same fish was found plentifully in both branches of the Hamilton River, above the Grand Falls with its sheer drop of 300 feet, it is certainly land-locked there. It is also common in the Koksoak River below Lake Kaniapiskau, above perpendicular falls of eighty feet and sixty feet. Common in Lake Michikamau on the head of the Northwest River. It is also reported by the Indians as numerous in the upper George River, the Romaine River, the Manicouagan and several other of the rivers flowing into the Gulf of St. Lawrence. It has not yet been reported from the rivers of the western watershed. Average weight of the fish caught, not above three pounds. The Indians report that the largest in the Hamilton River do not exceed ten pounds in weight.

Salmo Hearnii, Richardson (Hearne's Salmon).—A small salmon, with bright red spots on its sides, is found along the northern east coast of Hudson Bay, and probably belongs to this species. Its southern limit is a small river a few miles south of Cape Jones. It is taken in nets set in the salt water near Long Island, just north of Cape Jones, and also in some small streams flowing into Richmond Gulf. The Eskimo also report it common in some of the rivers north of Richmond Gulf.

Salvelinus namaycush (Walbaum), Goode (Great Lake Trout).—Very plentiful in all the larger lakes of the interior northward to Hudson

Strait. Very abundant in the lake-expansions of the Hamilton River and Lake Michikamau. Average weight about 8 pounds, but many taken more than 25 pounds in weight.

Salvelinus fontinalis (Mitchill), Gill and Jordan (Brook Trout).—This fish is abundant in many of the rivers and lakes of the Labrador Peninsula. Sea-run fish of this species are plentiful along the shores and lower parts of the rivers from the St. Lawrence to the southern part of James Bay. On the Atlantic coast and Ungava Bay, they are particularly plentiful and of large size. Along these coasts the mouth of every river swarms with trout during the late summer and autumn. The largest fish reported was taken at Nachvak and weighed fourteen pounds. In the Koksoak and George rivers, the average weight of the sea-run trout is about seven pounds. In Hamilton Inlet, there is less change in the sea-run fish than along the coast. At Northwest River the fish are small and do not average over one pound in weight. Here they were freely taken with a fly, up to the middle of December, when the mouth of the river was frozen over. In the mouth of the Hamilton River, sea-run trout average about three pounds in weight.

In James Bay, the trout taken along the coast and in the lower parts of the rivers are generally small and do not exceed two pounds in average weight. Between the lowest falls and the upper waters of the western rivers, brook trout are rarely taken, but in the northern, eastern and many of the southern rivers they are abundant along their entire length.

In the Koksoak River, for a few miles below Lake Kaniapiskau, large trout were abundant, but lower down they became smaller, until the sea-run fish were met with. On the Hamilton River, below the Grand Falls, the trout do not average over one pound in weight. Above the falls, the fish are much larger, and average more than three pounds in weight, while fish of five pounds and seven pounds are common. On the Romaine River, no trout were taken until the Burnt Lakes were passed, when they became plentiful, though small. Outside of the rivers and small streams, this species is found abundantly in most of the numberless lakes throughout the interior. Two varieties are met with everywhere; one has pink flesh, the other yellow, the former having the finest flavour.

Esox lucius, Linn. (Pike).—This fish is found abundantly throughout the interior in the lakes and quiet-flowing streams; common on the rivers of the southern, eastern and western watersheds; not so abundant in the Koksoak River. It varies in weight from two to fifteen pounds.

Anguilla (Sp).—The Indians report eels as common in the upper Romaine River.

Stizostedion vitreum (Mitchill), Jordan and Copeland (Wall-eyed Pike, Doré, "Perch" of the Hudson Bay Co).—Common in the southern rivers flowing into Lake St. John and to the westward, also in the Rupert and East Main rivers of the western watershed. Rare in the Bet-siamites River, and not found east of that stream, being unknown to the Indians of Mingan. Not found in the Big River, or streams to the north of it, nor in the rivers of the eastern or northern watersheds. Average weight, three pounds.

Lota maculosa (Le Sueur), Cuvier and Valenciennes (Ling, LaLoche, Maria).—Common in all the deep lakes throughout the interior. An important source of food for the Indians, owing to its taking bait freely during the winter months, when other fish cannot be caught. Weight, two pounds to fifteen pounds.

Gadus callarias, Linn. (Common Cod-fish).—Plentiful along the St. Lawrence and Atlantic coasts to Cape Chidley, also along the east shore of Ungava Bay to the mouth of George River. The following abstract from the Census of Newfoundland (1891) will show the extent and value of the cod-fishing of the Atlantic coast:—

"10,478 men, 2081 women and 828 children were employed in the fishery in 861 vessels, of which the tonnage amounted to 33,689 tons. The total catch of codfish amounted to 488,788 quintals." Fishing beyond Cape Chidley, along the east coast of Ungava Bay, was not undertaken until 1893, when a Newfoundland steamer was so successful that in 1894 two steamers and three schooners made successful catches in the neighbourhood of Port Burwell. The Eskimo report cod as being plentiful about the mouth of George River in the month of August. It is at present unknown whether this fish enters Hudson Bay, and it is a question which should speedily be settled by a properly equipped vessel, as valuable fisheries in the northern part of that great body of water may be lying idle for want of proper information concerning them.

APPENDIX IV.

LIST OF INSECTS COLLECTED IN THE INTERIOR OF THE LABRADOR
PENINSULA, 1894. DETERMINED BY DR. JAS. FLETCHER,
DOMINION ENTOMOLOGIST.

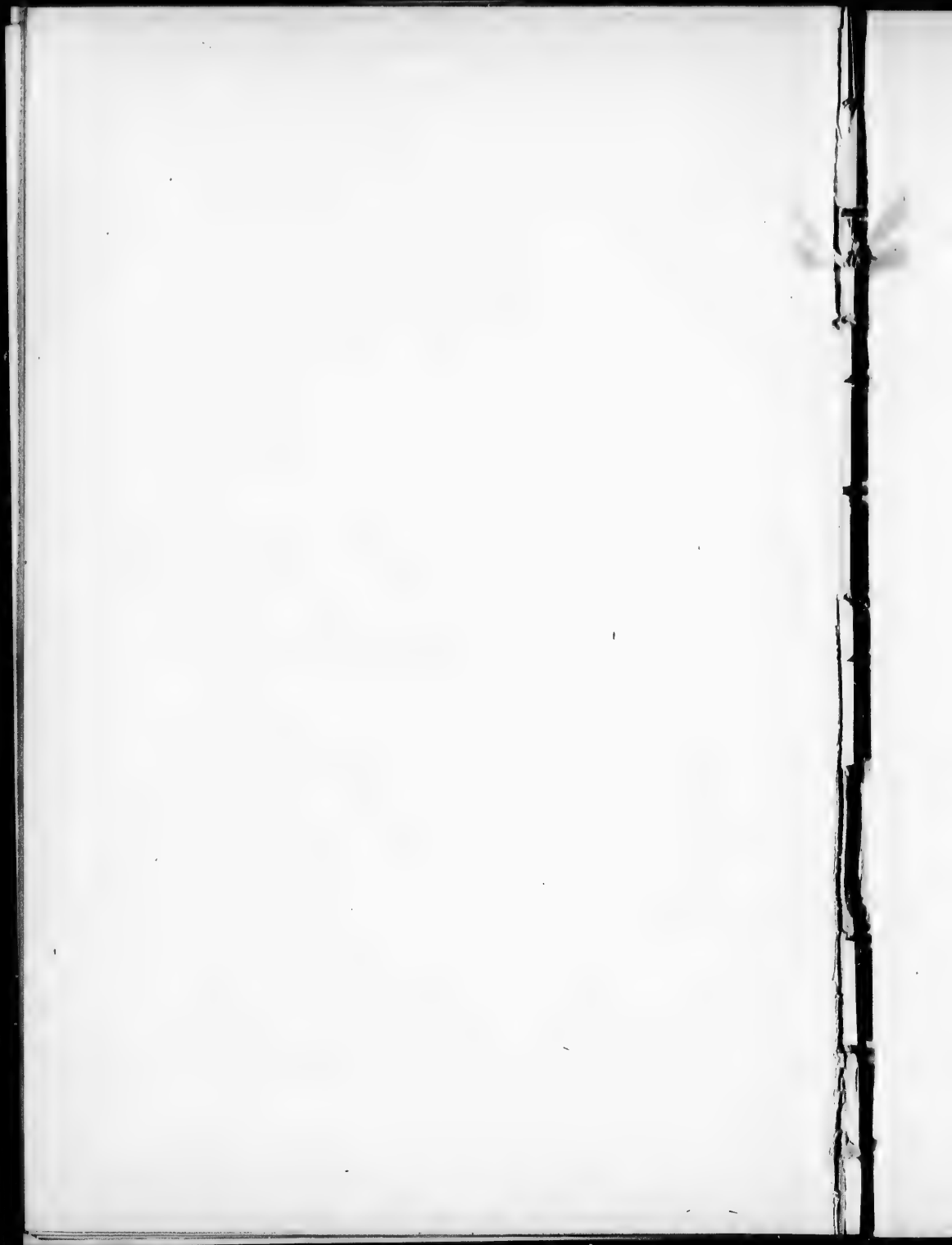
LEPIDOPTERA.

<i>Argynnis Atlantis</i> , Edw.....	16th July.....	1 specimen.
" <i>Chariclea</i> , Ochs.....	16th July.....	6 "
" <i>Triclaris</i> , Hbn.....	8th to 16th July.....	4 "
<i>Chionobas Jutta</i> , Hbn.....	.....	1 "
<i>Lycena Lucia</i> , Kirby.....	26th to 28th May.....	5 "
<i>Colias Scudderii</i> , Reak.....	20th to 27th July.....	7 "
<i>Papilio Turnus</i> , L.....	10th July.....	4 "
<i>Pyrgus Centauriae</i> , Ramb.....	18th June to 16th July.....	7 "
<i>Larva Rossii</i> , Curtis.....	12th May.....	2 "
<i>Rheumaptera hastata</i> , L.....	20th July.....	
<i>Agrotis (?)</i>	19th July.....	

COLEOPTERA.

195. <i>Nebria Sahlbergi</i> , Fish.....	.....	1 specimen.
206. <i>Pelophila Ulkei</i> , Horn.....	.....	5 "
<i>Agabus (?)</i>.....	.....
<i>Pterostichus (?)</i>.....	.....
1706. <i>Silpha Lapponica</i> , Hbst.....	.....	2 specimens.
1490. <i>Dytiscus dauricus</i> , Gebl.....	.....	2 "
3059. <i>Coccinella transversoguttata</i> , Fab.....	.....	2 "
4787. <i>Eros aurora</i> , Hbst.....	.....	1 "
4901. <i>Podabrus piniphilus</i> , Esch.....	.....	1 "
6273. <i>Acmaeops proteus</i> , Kirby.....	.....	2 "
6452. <i>Pogonocherus penicellatus</i> , Lec.....	.....	1 "
6557. <i>Syneta ferruginea</i> , Germ.....	.....	1 "
6843. <i>Goniocetena pallida</i> , L.....	.....	2 "

NOTE.—Insect life is not abundant in the interior of the Labrador Peninsula, and the above list probably represents over half of the species of Lepidoptera and Coleoptera commonly found about the region drained by the upper Hamilton River. A few more butterflies were seen of which specimens could not be obtained, but in all they did not make more than three or four extra species.



APPENDIX V.

NOTES ON THE MICROSCOPIC STRUCTURE OF SOME ROCKS FROM THE LABRADOR PENINSULA.

BY

W. F. FERRIER, B. A. Sc., F.G.S.,

Lithologist, Geological Survey of Canada.

INTRODUCTORY REMARKS.

The following notes on a series of thirty-four rock specimens, collected by Mr. A. P. Low in the Labrador Peninsula, in 1893, 1894 and 1895, are offered as a contribution to our knowledge of the petrography of that little-known country.

It must be understood, however, that the proportions in which the various rock types occur in the collection do not in any sense represent the relative frequency of occurrence of these types in the field. Only such specimens as were of a doubtful character, or had some special points of interest attaching to them, were selected by Mr. Low for microscopic examination.

Of the thirty-four specimens examined, some fourteen are undoubted diabases and gabbros of varying degrees of freshness. Eight others, now mainly dioritic, have probably been derived from similar rocks by alteration. One specimen (23) was apparently originally a diorite. Three hornblende-schists or amphibolites (4, 16, 17) have been, without doubt, produced by the crushing and shearing of basic eruptives.

Three of the diabases (32, 33, 34) have been already described by Mr. A. E. Barlow,* and are of interest as containing decomposed porphyritic crystals of plagioclase very similar to the "Huronite" of Dr. Thompson.† Among the gneissic rocks the interesting hypersthene syenite gneiss (6) may be specially noted.

The granites, quartz porphyries and syenites are not numerous in the collection, the two former being represented by a single specimen each (19, 5), and the latter by two specimens (6, 21).

* On some Dykes containing Huronite. *Ottawa Naturalist*, vol. IX., No. 2, 1895.

† Thompson's *Mineralogy*, I., p. 384, 1896.

The beautifully fresh felspar-free pyroxenite or hypersthénite (13) is worthy of special mention as an excellent example of these rocks, which have seldom been met with in Canada.

The white anorthosite (24) is a typical example of its class, and closely resembles those described by Dr. Adams from the Saguenay and Morin areas of Norian rocks.

Rocks of elastic origin are represented in the collection by a fine-grained greywacke (9) which, in the hand specimen, might readily be taken for an eruptive, and a much altered specimen (1) which may possibly be an ash-rock.

The literature of the subject is not very extensive, and those papers which enter into details regarding the rocks deal chiefly with the anorthosites.

A list of the principal papers and books which have appeared, taken, with some additions and alterations, from Dr. Adams's paper on the Norian rocks of Canada,* is here appended:—

Adams, F. D.:—

Ueber das Norian oder Ober-Laurentian von Canada. Stuttgart, 1893; also translation of same in Canadian Record of Science, Vol. VI., 1895.

Barlow, A., Esq.:—

On some Dykes containing Huronite. Ottawa Naturalist, Vol. IX., No. 2, 1895.

Baddeley, Lieut. (F. H.):—

Geology of a portion of the Labrador Coast. Trans. Lit. and Hist. Soc. of Quebec, Vol. I., 1829.

Bayfield, Capt.:—

Notes on the Geology of the North Coast of the St. Lawrence. Trans. Geol. Soc., London, Vol. V., 1833.

Bell, Robert:—

Observations on Geology, Mineralogy, Zoology and Botany of the Labrador Coast, Hudson's Bay and Strait. Ann. Rep., Geol. Surv. Canada, 1882-84.

The Labrador Peninsula. The Scottish Geographical Magazine, Vol. XI., No. 7, 1895.

Cayley, Ed.:—

Up the River Moisie. Trans. Lit. and Hist. Soc. of Quebec, Vol. V., 1862.

*Ueber das Norian oder Ober-Laurentian von Canada, Stuttgart, 1893: also translation in Canadian Record of Science, vol. VI., 1895.

Cohen, E.:—

Das Labradorit-führende Gestein der Küste von Labrador. *Neues Jahrb. für Min.*, 1885, I., p. 183.

Davies, W. H. A.:—

Notes on Esquimaux Bay and the surrounding Country. *Trans. Lit. and Hist. Soc. of Quebec*, Vol. IV., 1843.

Hind, H. Y.:—

Observations on Supposed Glacial Drift in the Labrador Peninsula, etc. *Q. J. G. S.*, Jan., 1864.

Explorations in the Interior of the Labrador Peninsula. London, 1863.

Jannasch, P.:—

Ueber die Löslichkeit des Labradors von der Paulinsel in Salzsäure. *Neues Jahrb. für Min.*, 1884, II., p. 42.

Lieber, O. M.:—

Die amerikanische astronomische Expedition nach Labrador, im Juli, 1860. *Peterm. Mitth.*, 1861.

Low, A. P.:—

On the Mistassini Expedition. *Ann. Rep., Geol. Surv. Canada*, 1885, Part D.

The Recent Exploration of the Labrador Peninsula. *Canadian Record of Science*, Vol. VI., No. 3, 1894.

Packard, A. S.:—

The Labrador Coast. London, 1861.

Observations on the Glacial Phenomena of Labrador and Maine, etc. *Mem. Boston Soc. Nat. Hist.*, Vol. I., 1865.

Observations on the Drift Phenomena of Labrador. *Canadian Naturalist (New Series)*, Vol. II., 1865.

The Labrador Coast. London, 1891.

Puyjalon, H. de:—

Report on the Copper, etc., found to exist on the North Shore of the Gulf of St. Lawrence. Report of Com. of Crown Lands, Province of Quebec, 1883.

Report of Exploration for minerals on North Shore of the Gulf of St. Lawrence. Report of Com. of Crown Lands, Province of Quebec, 1884.

These two reports contain references to the anorthosites, syenites and other rocks of the region.

Reichel, L. J.:—

Labrador, Bemerkungen über Land und Leute. *Peterm. Mitth.* 1863.

Richardson, J.:—

The Geology of the Vicinity of Lake St. John. Rep. Geol. Surv. Canada, 1857.

The Geology of the Lower St. Lawrence. Rep. Geol. Surv. Canada, 1866-69.

Roth, J.:—

Ueber das Vorkommen von Labrador. Sitz. Berlin. Akad. XXVIII., p. 697, 1883.

Selwyn, A. R. C.:—

Summary Reports of the Geol. Surv. Canada, for 1879-80 and 1880.

Selwyn, A. R. C., and Dawson, G. M.:—

Descriptive Sketch of the Dominion of Canada. Published by Geol. Surv. Canada, 1882.

Steinhauer, M.:—

Note relative to the Geology of the Coast of Labrador. Trans. Geol. Soc., London, Vol. II., 1814.

Van Hise, C. R.:—

Correlation Papers, Archean and Algonkian. Bull. U. S. Geol. Surv., No. 86, p. 398, 1892.

Vogelsang, H.:—

Sur le Labradorite Coloré de la Côte du Labrador. Archives Néerlandaises, T. III., 1868.

Van Werveke, L.:—

Eigenthümliche Zwillingbildungen am Feldspath und Diallag. Neues Jahrb. für Min., 1883, II., p. 97.

Wichmann, A.:—

Ueber Gesteine von Labrador. Zeitschr. d. d. Geol. Ges., 1884, p. 486.

Wilkins, D. F. H.:—

Note on the Geology of the Labrador Coast. Canadian Naturalist (New Series), Vol. VIII., 1878.

Williams, G. H.:—

Describes Porphyritic Diabase or Diabase Porphyrite from Nachvak, and Hornblende Pyroxenite from near Skynner's Cove, Nachvak, Labrador. Ann. Rep., Geol. Surv. Canada, Vol. V., Part I., 1890-91. Part F., Appendix I., Nos. 38 and 43.

DESCRIPTIONS OF THE ROCKS.

1. ASH ROCK?—Outlet of Dyke Lake, Ashuanipi Branch, Hamilton River.

A dark coloured, fine-grained rock, having an amygdaloidal appearance, due to embedded rounded little masses of crystalline calcite with some harder mineral stained red.

The rock exhibits imperfect partings and has porphyritically-developed bisilicates scattered through it, now much decomposed.

Under the microscope it is seen to be composed of a confused mass of secondary iron ore, chlorite, epidote, calcite, etc., with some small, quite fresh, porphyritic hornblende crystals, which have good cleavage and somewhat sharp crystal outlines.

Owing to the extreme alteration of nearly all its constituents, it is impossible to refer the rock with certainty to any particular type, but I am inclined to think that it may be a bedded ash rock.

2. URALITIC GABBRO, OR GABBRO DIORITE.—Great Bend, East Main River.

A dark green, fine-grained, laminated rock, somewhat mottled with white calcite, and having pyrite plentifully scattered through it.

In the thin section it is seen to be much altered, squeezed, and sheared, producing very uneven extinction in its constituent minerals.

It possesses a crystalline granitic structure, and consists chiefly of plagioclase, hornblende, magnetite, quartz, pyrite, apatite, epidote and chlorite.

The plagioclase is in allotriomorphic individuals which are almost entirely saussuritized, but still retain traces of the original twinning striation, and are frequently penetrated by slender little crystals of apatite.

The hornblende, which has every appearance of being secondary in origin, is the "compact"* variety so characteristic of those rocks which have been subjected to metamorphism. It is green in colour and strongly pleochroic, with α = greenish-yellow, β = yellowish-green, and γ = bluish-green. Teall† has pointed out that this development of hornblende at the expense of augite or diallage in basic igneous rocks in regions not affected by contact metamorphism, is one of the most definitely established facts in petrographical science.

The hornblende of this rock occurs in irregular aggregates of grains having no uniform orientation. Some quartz, apparently secondary, much cracked, and with very uneven extinction, is present, and pyrite is exceedingly abundant.

* That is, homogeneous, neither fibrous, nor actinolitic.

† British Petrography, 1888, p. 161.

This combination of saussurite and secondary "compact" hornblende, as the result of the alteration of gabbros, is very characteristic and has frequently been described.

3. DIABASE, 'HIGHLY ALTERED.—Head of Dyke Lake, Ashuanipi Branch, Hamilton River.

A dark gray, fine-grained, rusty-weathering rock, holding numerous small white oval patches, consisting chiefly of calcite, which give it a decidedly porphyritic appearance. Smaller, dark coloured porphyritic forms also occur, which were probably augites.

On weathered surfaces the rock has a cavernous appearance, due to the removal of the calcite in the oval areas referred to above.

As seen in the thin section, the rock is much altered and filled throughout with crystalline calcite.

Small, interlacing, lath-shaped crystals of plagioclase make up the bulk of the section, giving to it a decided ophitic structure, and it is thickly sprinkled with little granules of secondary iron ore and scales of chlorite. Comparatively large patches of calcite and chlorite represent what were probably originally phenocrysts of plagioclase and augite.

The rock is apparently a much altered and highly calcareous diabase.

4. HORNBLLENDE SCHIST, PROBABLY RESULTING FROM THE SHEARING OF SOME BASIC ERUPTIVE.—Jacopie Lake, Hamilton River.

A rather light green, fine-grained, glossy, chloritic schist, with intercalated red felspathic layers, and very wavy and crinkled lamination.

Microscopic examination shows that it has been subjected to intense shearing action, the hornblende being all pulled-out, and the larger plagioclase fragments occurring in elongated streams of finely-granulated material of the same kind.

The principal minerals present are hornblende, feldspar (both striated and non-striated), chlorite, epidote, a little quartz, and a very little iron ore and titanite.

Streaks of finely-granulated feldspar, evidently derived from the breaking-up of larger individuals, fragments of which still occur distributed through the granulated material, alternate with wavy streaks of hornblende pulled-out in the same manner from larger individuals. These hornblende layers wind around the larger fragments of feldspar in such a manner as to give a regular "flow-structure" to the section.

In one instance a large feldspar individual lies almost at right angles to the general direction of lamination of the rock, and the hornblende layers bend around it in a most marked manner.

Both twinned and untwinned felspar grains occur, but the former are more plentiful. Inclusions are very common.

The hornblende is compact, except where it has been excessively drawn-out by the shearing action to which the rock has been subjected. It is now generally of pale yellowish or bluish-green tints, owing to chloritization, possesses well-marked cleavages, and rather feeble pleochroism.

The rock may be regarded as a greatly sheared and crushed basic eruptive, perhaps a diorite.

5. CRUSHED QUARTZ PORPHYRY.—Mouth of Akuatago River, East Main River.

In the hand specimen this is a medium-grained rock of a somewhat dark gray colour, mottled with whitish phenocrysts of quartz and felspar, and with a lamination due to shearing. Many of the quartz phenocrysts exhibit a bluish opalescence. Pyrite and calcite are plentiful, the rock effervescing freely with dilute hydrochloric acid. The thin section shows a micro-granitic groundmass composed of quartz and felspar, in which lie numerous phenocrysts of quartz and felspar, the former frequently having a rude dihexahedral form, and the latter being mainly non-striated and probably orthoclase.

Biotite in irregular scales and aggregates, accompanied by some muscovite, is abundant. A little hornblende is present, and pyrite, epidote, chlorite, titanite, zircon, and apatite also occur.

The rock has been greatly crushed and sheared; the phenocrysts of both quartz and felspar possess very uneven extinction, are much cracked, and peripherally granulated.

The felspar is decomposed and filled with carbonates, epidote, muscovite, and other alteration products. A few slender needle-like crystals of an intensely pleochroic (indigo-blue to light yellow or almost colourless) mineral resembling tourmaline were observed. The biotite is largely altered to chlorite. Some of the epidote possesses the low double refraction of zoisite. The rock may be regarded as a much crushed and sheared quartz porphyry. Only small portions of it have resisted the crushing action.

6. HYPERSTHENE SYENITE GNEISS.—First Gorge of the Koksoak River.

A rather coarse-grained, greenish-gray, gneissic rock, with granitic structure, and consisting chiefly of a non-striated felspar, a little quartz, an orthorhombic pyroxene strongly pleochroic in light-green and pink tints, a deep reddish-brown pleochroic biotite, apatite, and iron ore.

A very few grains of plagioclase were also observed. Micropegmatitic structure is beautifully shown in portions of the section. The rock is tolerably fresh, but the orthorhombic pyroxene (hypersthène) shows the characteristic alteration, the grains being traversed by a network of cracks filled with serpentinous material.

A determination made in the Laboratory of the Survey, gave 62.68 as the percentage of silica present in the rock. This would place it with the syenites rather than with the granites, and it might perhaps be termed a hypersthene syenite containing a little quartz. It bears a close resemblance to some of the rocks from Château Richer, Quebec, described by me as pyroxene granite gneisses but which have not yet been analysed.

7. GABBRO, APPROACHING DIABASE IN STRUCTURE.—End of Survey, Ashuanipi Branch, Hamilton River.

A very dark coloured, medium-grained, massive-looking rock, having for its principal mineral constituents plagioclase feldspar, stained brown by decomposition products; monoclinic and orthorhombic pyroxenes, the former being the more abundant; some deep reddish-brown strongly pleochroic biotite; ilmenite accompanied in some cases by leucoxene; a small quantity of apatite.

The structure, whilst in the main that of a gabbro, in some portions is ophitic, approaching in that respect to a diabase.

8. GABBRO GNEISS ?.—Ossokmannau Lake, Attikonak Branch, Hamilton River.

A medium-grained, dark green and brown, rusty, gneissic rock, which, under the microscope, is seen to be greatly granulated, affording an excellent example of Tornebohm's "mortar-structure." Both striated and non-striated feldspars are present, the latter in considerable quantity, so that a separation would be necessary to determine its true character. But I am inclined to believe that much of this non-striated material is plagioclase, as pressure-twinning has been developed in portions of some of the grains. Quartz is present, but not abundant, and both monoclinic and orthorhombic pyroxenes occur. The monoclinic form is pale-green in colour and feebly pleochroic, whilst the orthorhombic (hypersthene) is strongly pleochroic in red and green tints. Hornblende and biotite occur in small irregular individuals, and ilmenite with leucoxene is very abundant. The rock has a granitoid structure, and exhibits abundant evidence of intense dynamic action in the cracking and granulation of its constituent minerals,

*Ann. Rep., Geol. Surv. Can., vol. V., 1890-91, part L., appendix, pp. 81, 82.

and their very uneven extinctions. It is stained a yellowish-brown colour throughout, due to hydrous oxides of iron.

9. GREYWACKE.—Outlet of Cambrian Lake, Koksoak River.

An exceedingly fine and even-grained, massive, dark green, rusty-weathering rock, the clastic origin of which is at once revealed by the microscope. It consists of angular and sub-angular fragments of quartz and felspar with granules of iron ore and epidote, in a ma'rix, not at all abundant, of sericitic and chloritic material. Both striated and non-striated felspar are present, and the rock is a typical greywacke.

10. DIORITE ?.—Ten miles above Broken Paddle River, East Main River.

This is a medium-grained massive rock, of a very dark green colour, mottled with yellowish-brown, and showing an indistinct foliation. The microscope shows it to consist of a clear mosaic of interlocking grains, evidently re-crystallized, and containing both felspar and quartz, although it is now impossible to distinguish between the two minerals without obtaining axial figures.

Through this mosaic are scattered irregular patches of a green, strongly pleochroic, compact hornblende, which has a secondary appearance, and is frequently arranged in rudely radiating groups of individuals. It is intimately associated with patches of granular, and apparently secondary, iron ore. The section suggests a basic eruptive rock, which has been changed to its present conditions by contact or dynamic metamorphism.

11. DIORITE, EXTREMELY ALTERED.—Muskkrat Falls, Hamilton River.

A medium-grained, somewhat foliated, dark yellowish-green, rusty weathering rock, the hand specimen of which is studded with small cubes of pyrite. Under the microscope it is seen to be in a highly altered and crushed condition, consisting now chiefly of much decomposed and granulated plagioclase felspar, small masses of fibrous chloritized hornblende evidently secondary in origin, and patches of a peculiar deep brown granular titanite, which, from the fact that they hold occasional cores of ilmenite, have probably been derived from the alteration of that mineral.

The whole section is filled with the products of decomposition, such as epidote, chlorite, and sericite, and is plentifully sprinkled with pyrite. The rock is evidently a much altered diorite, perhaps derived from a gabbro.

12. URALITIC GABBRO.—Lookout Mountain, near Grand Falls, Hamilton River.

A medium-grained, mottled green and yellowish-white, massive-looking rock.

The thin section shows it to be greatly altered, with a gabbro-like structure, and consisting principally of plagioclase felspar (some non-striated grains also occur); hornblende of a pale green colour and uralitic appearance, having the borders of the grains of a darker colour than the centres; a deep brown strongly pleochroic biotite intimately associated with the hornblende, and ilmenite with leucoxene.

The felspar is full of prismatic crystals of epidote and scales of sericite. Chlorite is very abundant in the section. The rock is evidently an altered gabbro.

13. PYROXENITE (HYPERSTHENITE).—Five miles above the Minipi Branch, Hamilton River.

The hand specimen shows a coarse-grained mixture of broad tabular crystals of hypersthene and plates of biotite, the rock being of a brownish-green colour, and these two minerals apparently its sole constituents.

About the only minerals observed in the thin section were a strongly pleochroic orthorhombic pyroxene (hypersthene) and a deep brown biotite. A very few minute areas of a clear, colourless mineral, apparently quartz, lie between some of the pyroxene grains.

The orthorhombic pyroxene is quite fresh, and, as stated, strongly pleochroic, with μ = red, ν = yellowish-green, π = green.

Examined in convergent light it gave the optical characters of hypersthene. It is remarkably free from the dark scales and rods usually present in that mineral, a fact already noted by Dr. Adams in the case of the Norian rocks of Canada.* The rock is evidently a member of the pyroxenite group and may be termed a hypersthene.

14. DIABASE?, EXTREMELY ALTERED.—First Portage from Obatogoman Lake to Chibougamoo Lake.

A pale green, fine-grained, rusty-weathering, massive-looking rock, with indistinct traces of foliation. This is an extremely altered basic eruptive, probably a diabase, as traces of ophitic structure can still be detected in the section, which is traversed by little cracks filled with quartz, and exhibits such a stage of decomposition as to render a minute description of no special interest. The bisilicate, augite, origi-

* Ueber das Norian oder Ober-Laurentian von Canada. F. D. Adams. Stuttgart, 1893.

nally present, has been changed to a fibrous hornblende, and this again is largely altered to chlorite. The plagioclase feldspar is almost completely saussuritized.

15. PORPHYRITIC DIABASE.—On the portage route between Obatogoman and Chibougamoo lakes.

A dark green, fine-grained, massive, porphyritic rock, with distinct ophitic structure in the groundmass and having numerous large phenocrysts of plagioclase scattered through it.

The rock is much altered, but the ordinary structure of a diabase is seen in the thin section. The numerous porphyritically-developed plagioclases are much saussuritized. The section is thickly sprinkled with small granules of iron ore and presents no unusual features.

16. AMPHIBOLITE (SHEARED BASIC ERUPTIVE).—Ten miles above Broken Paddle River, East Main River.

A medium-grained, pale greenish, well-foliated schistose rock, with slickensided surfaces evidently due to shearing. The thin section shows that the rock has been subjected to intense dynamic action, consisting now of a very finely granulated mosaic of quartz and feldspar in which a few larger fragments of these minerals are embedded, together with bunches of a fibrous hornblende, now largely altered to chlorite, and patches of a peculiar deep brown granular titanite evidently resulting from the decomposition of ilmenite and still holding an occasional small core of that mineral.

The rock has evidently resulted from the shearing and crushing of some basic eruptive, perhaps a gabbro.

17. AMPHIBOLITE (SHEARED BASIC ERUPTIVE).—Ten miles above Broken Paddle River, East Main River.

A dark green, medium-grained, distinctly banded rock, having a much more massive appearance than No. 16, to which, as regards origin, it is closely allied; but re-crystallization has proceeded farther in this case and it is consequently in a much fresher condition. Its foliated character is well seen in the section. The quartz and feldspar form a clear interlocking mosaic, and the hornblende is of the "compact" variety so characteristic of rocks of this class and is intergrown with the quartz and feldspar. A brown pleochroic biotite, apparently secondary in origin, is abundant in small scales distributed through the quartz-feldspar mosaic. Small granules of iron ore are also plentiful.

The rock as seen in the section is apparently the final stage of alteration of some basic eruptive and greatly resembles that described by Teall in the case of the Scourie Dyke in Scotland.*

18. URALITIC DIABASE.—Two miles below Ross Gorge, East Main River.

In the hand specimen this is a dark greenish-gray, fine-grained, massive rock, with distinct ophitic structure and containing much pyrite.

The section reveals the fact that both plagioclase and augite are extremely altered, but the structure of the rock is undoubtedly that of a diabase. Granules of iron ore and epidote are plentifully scattered through it in addition to the pyrite.

The augite has altered to a fibrous hornblende which, in its turn, has become largely chloritized.

19. HORNBLENDE GRANITE GNEISS.—Three miles above Grand Falls, Hamilton River.

A rather coarse-grained, well-foliated, greenish and yellowish "augen"-gneiss.

A marked cataclastic and foliated structure is exhibited in the thin section. Larger fragments of quartz and felspar are embedded in a finer-grained mosaic of the same materials, through which run strings of hornblende and biotite with large crystals of a clove-brown, strongly pleochroic titanite.

Both orthoclase and plagioclase occur, the former predominating, and occasionally showing the structure of microcline due to pressure.

The rock has apparently been partially re-crystallized and is filled with needles and irregular grains of epidote. The larger fragments of quartz and felspar are remarkably full of inclusions of this and other minerals. The titanite crystals are remarkable for their size and deep brown colour.

I regard the rock as being a hornblende granite squeezed into a gneiss.

20. DIABASE, EXTREMELY ALTERED.—Lake Petitsikapau, Ashuanipi Branch, Hamilton River.

A fine-grained, dark green, massive rock, full of pyrite. The thin section shows two portions of the rock, an outer and more altered portion, and an inner one, which, whilst still much altered, is not quite so much so as the outer or surface portion.

*Teall. On the Metamorphosis of Dolerite into Hornblende Schist. Q. J. G. S., vol. XLI, 1885, p. 133; also British Petrography. pp. 154, 198-200, and plate XXI.

The mass is evidently diabasic in character, the ophitic structure being still visible. The pyroxene now exists as small cores in masses of brown serpentinous decomposition products lying between the lath-shaped sections of plagioclase. The lighter and more highly altered portion of the section contains more light green chlorite than the darker.

Irregular patches of leucoxene with occasional cores of ilmenite, and pyrite, are plentiful. An orthorhombic pyroxene is also apparently present in small quantity. Epidote is abundant, often in radiating bundles of needle-like crystals.

21. CRUSHED GRANITE (OR SYENITE?).—Foot of Great Bend, East Main River.

A mottled, greenish-gray and white, medium-grained, granitic-looking rock, which has been greatly crushed and now consists of a mosaic of feldspar and quartz lying between larger grains of these minerals ("mortar-structure"), with scales of biotite plentifully distributed throughout the mass. Epidote is exceedingly abundant, and occasionally encloses sharply defined pleochroic allanite crystals. Much of it has evidently resulted from the saussuritization of the feldspar and is accompanied by sericite.

Both orthoclase and plagioclase are present, but the former greatly predominates. Some titanites and apatites also occur.

In the particular section examined, quartz is comparatively scarce, and suggests that a further study and analysis of the rock might lead to its being placed with the syenites rather than with the granites.

22. DIABASE, MUCH ALTERED.—Outlet of Dyke Lake, Ashuanipi Branch, Hamilton River.

An exceedingly fine-grained, dark green, rusty-weathering, compact, massive rock, with occasional feldspar crystals embedded in it. It is now extremely decomposed and filled with calcite, epidote, chlorite, hydrous oxides of iron, and other alteration products, but traces of its original ophitic structure may still be seen. Magnetite in small granules and crystals is abundant. The rock is undoubtedly a highly altered diabase.

23. DIORITE?—Five miles below Stillwater Branch, Koksoak River.

A medium-grained, greenish-gray, rusty weathering rock, which the thin section shows to be made up of a bleached chloritic hornblende-associated with much saussuritized plagioclase feldspar.

Leucoxene, resulting from the alteration of ilmenite, is abundant, and pyrite is also sprinkled through the mass. The hornblende conveys the impression of being primary in its origin and occasionally shows a twinned structure. The rock is probably a decomposed diorite.

24. ANORTHOSITE.—First lake on portage route from Romaine River to St. John River.

A pale grayish, almost white, medium-grained, crystalline granular rock, looking very much like a crystalline limestone.

Only a few streaks and spots of coloured bisilicates occur in the specimen, which is mainly composed of plagioclase felspar.

This is a typical representative of that division of the gabbro family in which the coloured constituents constitute only a very insignificant portion of the mass of the rock. The section is almost entirely composed of clear, colourless, well-striated labradorite with an extinction angle on $\infty P\bar{X}$ of about 25° . It is in general quite fresh, but traces of alteration to sericite, calcite, epidote, zoisite, etc., were here and there observed. A very few irregular grains of a fresh green hornblende, with the characteristic cleavages and pleochroism of that mineral, are present, usually associated with an opaque iron ore, which also occurs in smaller granules dotted through the felspar.

Mica and hypersthene are also present in other portions of the rock.

25. MICA DIORITE GNEISS (CRUSHED AND ALTERED ERUPTIVE ?)—One mile above Broken Paddle River, East Main River.

In the hand specimen this is a dark greenish-gray, distinctly foliated and rusty-weathering rock, having numerous fragments and crystals of quartz, felspar, and hornblende scattered through the finer-grained groundmass, also numerous cubes of pyrite.

It has evidently been greatly crushed and squeezed and now consists chiefly of a fine-grained quartz-felspar mosaic containing larger fragments of these minerals, much biotite, and some hornblende largely altered to chlorite. Pyrite, titanite, epidote, ilmenite with leucoxene, and a large quantity of calcite are also present. Owing to the extremely granulated condition of the material it is difficult to make out the nature of the felspar, but plagioclase appears to predominate (it certainly does in the larger fragments) and the rock is probably the result of the crushing of a diorite or gabbro.

26. DIORITE (ALTERED GABBRO ?)—Near mouth of Akuatago River, East Main River.

A dark greenish-gray, medium-grained, indistinctly foliated rock.

The section bears evidence that it has been greatly crushed and granulated. Plagioclase felspar, hornblende, some quartz, biotite and iron ore are the principal minerals present. Pyrite, apatite, chlorite, and epidote also occur.

Much of the hornblende has a frayed-out, actinolitic appearance, and occasionally surrounds more compact cores of a deeper green colour, largely altered to chlorite, which resemble augites.

The biotite is largely secondary and is intimately intergrown with the hornblende.

The rock may be an extremely altered gabbro.

27. URALITIC GABBRO, WITH AN APPROACH TO DIABASIC STRUCTURE.—Eight miles above Broken Paddle River, East Main River.

A dark green mottled with white, compact, rusty-weathering rock. It is much altered and now consists chiefly of plagioclase felspar and a pale green uralitic hornblende, the individuals of which have borders of a deeper colour than the centres.

The section is filled with granules of epidote, chlorite, and other decomposition products. Some titanite is also present. An approach to diabasic structure may be seen in portions of the rock, which, in the main, may be regarded as a crushed and altered gabbro.

28. EXTREMELY CRUSHED PORPHYRITIC ROCK ?—Three miles above Broken Paddle River, East Main River.

A dark green, somewhat porphyritic, indistinctly foliated rock. The section exhibits such an extreme stage of granulation as to render a determination of the true character of the rock a matter of great difficulty.

Fragments of plagioclase, orthoclase, quartz, and granules of iron ore with numerous scales of an apparently secondary biotite, are scattered through a very fine-grained quartz-felspar mosaic. Pyrite is rather abundant.

29. DIORITE.—Prosper Gorge, East Main River.

A medium-grained, dark green, rusty-weathering, compact, massive rock. Plagioclase felspar and a pale green uralitic hornblende are its chief constituents, together with some biotite and iron ore.

The plagioclase is quite fresh, and portions of the section have a decided diabasic structure.

The whole of the hornblende may have resulted from the alteration of the augite of a diabase, as, although no cores of the latter mineral were detected, the hornblende has a secondary appearance.

30. ALTERED DIABASE.—One mile below Akuatago River, East Main River.

A dark green, chloritic-looking rock, which in the thin section exhibits a coarse ophitic structure, the spaces between the plagioclase crystals being filled with a mass of scales of rather pale brown biotite, evidently of secondary origin. The plagioclase is very turbid. No iron ore was seen in the section.

31. ALTERED DIABASE.—Three miles and a half above Broken Paddle River, East Main River.

A medium-grained, dark green, rusty-weathering, compact rock, in which the plagioclase felspar is almost completely saussuritized, retaining only traces of its original striation.

The augite is largely altered to pale green hornblende, chlorite and a serpentinous substance. Epidote, and ilmenite accompanied by leucoxene are abundant. A little quartz was seen.

The section shows the typical ophitic structure of a diabase.

[The three following descriptions of rocks from Labrador have been condensed from a paper by Mr. A. E. Barlow* of this Survey:]

32. GABBRO, WITH AN APPROACH TO DIABASIC STRUCTURE.—Ten miles north of Lake Kawachagami, on the portage route between the Rupert and East Main Rivers.

In the hand specimen this is a dark greenish gabbro-like rock, with yellowish-green plagioclase phenocrysts. It consists chiefly of plagioclase, augite and ilmenite.

The larger phenocrysts of plagioclase show marked alteration, and are precisely similar to those described by Thompson as "Huronite." Their specific gravity is 2.725.

The augite is largely altered to hornblende, but cores of the former mineral still remain. Ilmenite, occasionally altered to leucoxene, is rather abundant. Epidote is present as a decomposition product, and apatite is very plentiful. Considerable areas of granophyre were observed in the section, portions of which also show a coarse ophitic structure.

33. OLIVINE DIABASE.—Fault Hill, Dyke Lake, Ashuanipi Branch, Hamilton River.

In the hand specimen this is a medium-grained, dark green almost black rock, with occasional small imperfect phenocrysts of saussuritized

*On some Dykes containing Huronite, by A. E. Barlow M.A., Ottawa Naturalist, vol. IX., No. 2, 1895.

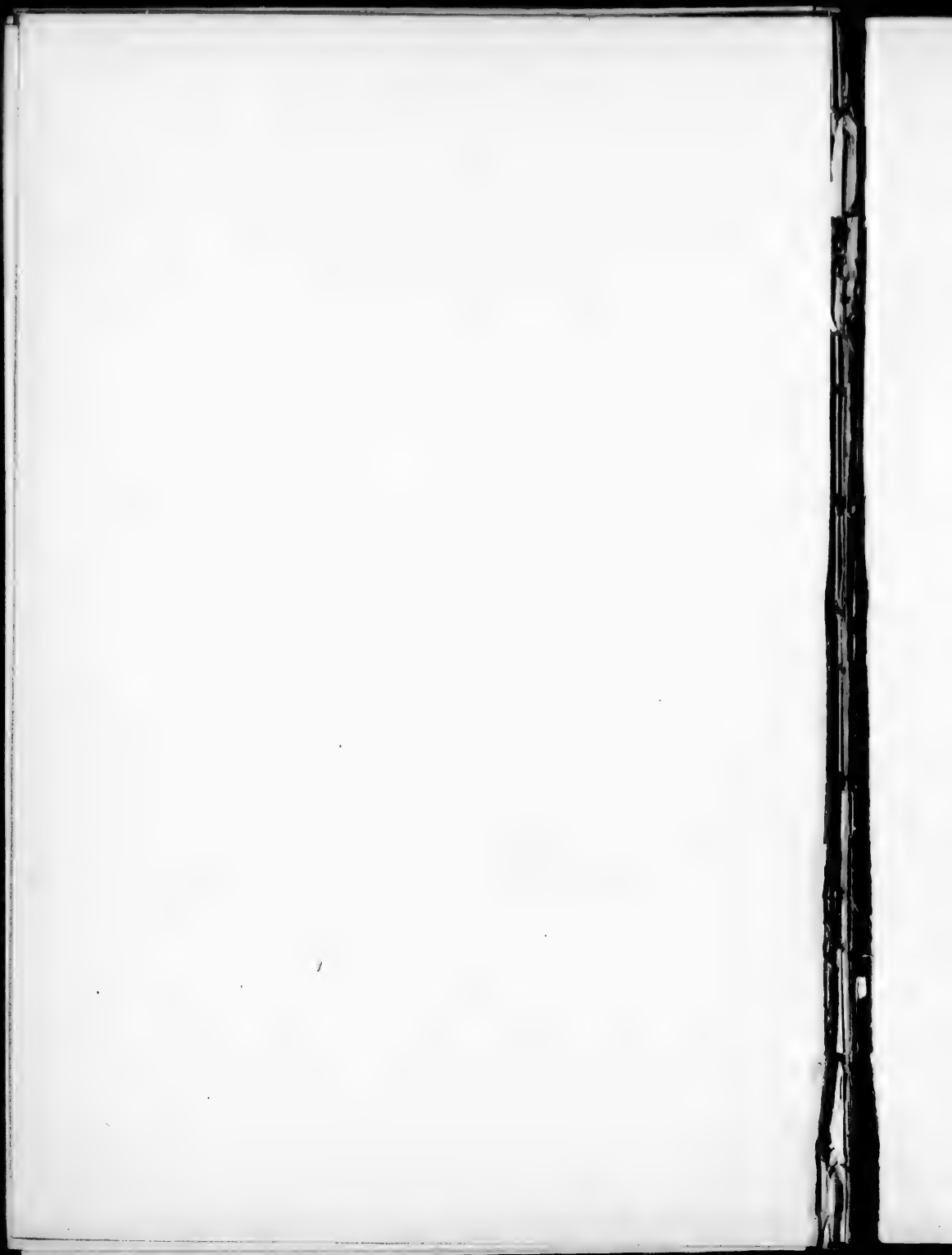
plagioclase. Under the microscope it is seen to be composed chiefly of plagioclase, considerably altered to saussurite, especially in the case of larger individuals; fresh brownish-red, pleochroic augite, mostly allotriomorphic in form, but occasionally with sharp crystal outlines; serpentine, which has evidently resulted from the alteration of olivine; and ilmenite in large irregular fragments and small granules, in both cases showing alteration to leucoxene.

34. DIABASE.—Near entrance to Dyke Lake, Ashuanipi Branch, Hamilton River.

A dark greenish-gray, rather coarse-grained rock, in which are embedded numerous phenocrysts of altered, greenish felspar (Huronite), some of which in the main mass of the rock are three-fourths of an inch in diameter.

They are extremely abundant, and, together with the plagioclases of the groundmass, are largely altered to sericite and epidote. Their specific gravity is 2.773.

The augite, when fresh, which is rarely the case, is reddish in colour and distinctly pleochroic. Ilmenite, altered to leucoxene, is abundant, as are also chlorite, apatite and pyrite.



APPENDIX VI.

LIST OF THE PLANTS KNOWN TO OCCUR ON THE COAST AND IN THE INTERIOR OF THE LABRADOR PENINSULA. COMPILED BY JAMES M. MACOUN.

The following list, which has been carefully compiled from lists already published and from MS. notes and specimens in the herbarium of the Geological Survey, is divided into four columns, so that the distribution of each species, so far as known, may be seen at a glance.

The first column contains those species known to occur on the coast of Labrador, the second those growing in the basin of the upper Hamilton River, the third those growing in the basins of the Rupert and East Main rivers and the fourth those growing along the shores of James Bay. The area included in the second and third columns comprises the whole central part of the peninsula, and many of the plants noted in the third column and not in the second doubtless grow in the basin of the Hamilton River; but, while the third column represents the collections made in three seasons, under favourable conditions and over a wide area, one season only was spent on the Hamilton River.

The first column has been copied from Dr. Packard's "The Labrador Coast," with the addition of a few species overlooked when his list was compiled, or which have since been collected. The species included in the other three columns have all been collected by Mr. Low or his assistants, Mr. J. M. Macoun having made the collections in 1885 and 1887, and Mr. A. H. D. Ross, in 1892, the very complete collection of the plants growing along the East Main River. Lists of the plants found at Lake Mistassini, on the Rupert River and along the shores of James Bay have been printed as addenda to Mr. Low's reports of 1885 and 1887, and to these the results of his explorations in 1888, 1892, 1893 and 1894 are now added.

Recent revisions of genera have in some cases changed the names that appear in this list, but to obviate the printing of synonyms the names under which species and varieties have been already recorded from the Labrador Peninsula have been retained, except where a correction was necessary or there was the possibility of confusing two plants: in such cases both names are given.

	1.	2.	3.	4.
RANUNCULACEÆ.				
<i>Anemone parviflora</i> , Michx.....	*	*	*	*
" <i>multifida</i> , DC.....	*	*	*	*
" <i>dichotoma</i> , Linn.....	*	*	*	*
<i>Thalictrum dioicum</i> , Linn.....	*	*	*	*
" <i>polygamum</i> , Muhl. (<i>T. Cornuti</i> , Linn.).....	*	*	*	*
<i>Ranunculus aquatilis</i> , Linn., var. <i>trichophyllus</i> , Chaix.....	*	*	*	*
" <i>Cymbalaria</i> , Pursh ..	*	*	*	*
" <i>repans</i> , Linn.....	*	*	*	*
" <i>atkinsii</i> , R. Br.....	*	*	*	*
" var. <i>validus</i> , Gray.....	*	*	*	*
" <i>abortivus</i> , Linn.....	*	*	*	*
" <i>recurvatus</i> , Poir.....	*	*	*	*
" <i>pygmaeus</i> , Wahl.....	*	*	*	*
" <i>nivalis</i> , Linn.....	*	*	*	*
" <i>acris</i> , Linn.....	*	*	*	*
" <i>Pennsylvanicus</i> , Linn.....	*	*	*	*
<i>Caltha palustris</i> , Linn.....	*	*	*	*
<i>Coptis trifolia</i> , Salisb ..	*	*	*	*
<i>Actæa spicata</i> , L., var. <i>rubra</i> , Ait.....	*	*	*	*
" <i>alba</i> , Big.....	*	*	*	*
NYMPHÆACEÆ.				
<i>Nuphar advena</i> , Ait.....	*	*	*	*
SARRACENIACEÆ.				
<i>Sarracenia purpurea</i> , Linn.....	*	*	*	*
PAPAVERACEÆ.				
<i>Papaver nudicaule</i> , Linn.....	*	*	*	*
FUMARIACEÆ.				
<i>Corydalis glauca</i> , Pursh.....	*	*	*	*
CRUCIFERÆ.				
<i>Nasturtium palustre</i> , DC.....	*	*	*	*
<i>Cardamine hirsuta</i> , Linn.....	*	*	*	*
" <i>pratensis</i> , Linn.....	*	*	*	*
<i>Arabis stricta</i> , Huds. (<i>A. confinis</i> , Wat.).....	*	*	*	*
" <i>alpina</i> , Linn.....	*	*	*	*
" <i>humifusa</i> , Wat., var. <i>pubescens</i> , Wat ..	*	*	*	*
<i>Barbarea vulgaris</i> , R. Br.....	*	*	*	*
<i>Erysimum cheiranthoides</i> , Linn.....	*	*	*	*
<i>Sisymbrium humile</i> , C. A. Meyer.....	*	*	*	*
<i>Draba alpina</i> , Linn., var. (?) <i>corymbosa</i> , Dur ..	*	*	*	*
" <i>stellata</i> , Jacq., var. <i>nivalis</i> , Regel.....	*	*	*	*
" <i>incana</i> , Linn.....	*	*	*	*
" var. <i>confusa</i> , Poir.....	*	*	*	*
" <i>arabizans</i> , Michx.....	*	*	*	*
" <i>aurea</i> , Vahl.....	*	*	*	*
<i>Cochlearia officinalis</i> , Linn.....	*	*	*	*
" <i>tridactylites</i> , Banks.....	*	*	*	*
<i>Capella Bursa-pastoris</i> , Mönch.....	*	*	*	*
<i>Thlaspi arvense</i> , Linn.....	*	*	*	*
<i>Viola blanda</i> , Willd.....	*	*	*	*
" <i>palmaria</i> , Linn., var. <i>cucullata</i> , Gray.....	*	*	*	*
" <i>palustris</i> , Linn.....	*	*	*	*
" <i>canina</i> , Linn., var. <i>Muhlenbergii</i> , Gray ..	*	*	*	*

	1.	2.	3.	4.
CARYOPHYLLACEÆ.				
<i>Silene Armeria</i> , Linn.				*
" <i>noctiflora</i> , Linn.				*
" <i>acaulis</i> , Linn.	*			*
<i>Lychnis apetala</i> , Linn.	*			*
" <i>alpina</i> , Linn.	*			*
<i>Arenaria verna</i> , Linn.				*
" " <i>var. hirta</i> , Wat.			*	*
" <i>Michauxii</i> , Hook.		*		*
" <i>Groenlandica</i> , Spreng.	*			*
" <i>serpyllifolia</i> , Linn.	*	*		*
" <i>lateriflora</i> , Linn.	*			*
" <i>peploides</i> , Linn.	*			*
<i>Stellaria media</i> , Smith.	*	*		*
" <i>borealis</i> , Bigel.	*			*
" " <i>var. alpestris</i> , Gray.	*		*	*
" <i>crassifolia</i> , Ehrh.	*	*		*
" <i>longipes</i> , Goldie.	*			*
" " <i>var. minor</i> , Hook.	*			*
" " <i>Edwardsii</i> , T. and G.	*			*
" <i>humifusa</i> , Rottb.	*			*
<i>Cerastium vulgatum</i> , Linn.			*	*
" <i>arvense</i> , Linn.	*	*		*
" <i>alpinum</i> , Linn.	*			*
<i>Sagina nodosa</i> , E. Meyer	*			*
<i>Buda borealis</i> , Wat. (<i>Spergularia salina</i> , Presl.)	*			*
PORTULACACEÆ.				
<i>Portia fontana</i> , Linn.	*			*
LINACEÆ.				
<i>Linum perenne</i> , Linn.				*
GERANIACEÆ.				
<i>Geranium Carolinianum</i> , Linn.			*	*
RHAMNACEÆ.				
<i>Rhamnus alnifolius</i> , L'Her.			*	*
SAPINDACEÆ.				
<i>Acer spicatum</i> , Lam.			*	*
LEGUMINOSEÆ.				
<i>Trifolium repens</i> , Linn.				*
<i>Astragalus alpinus</i> , Linn.	*			*
<i>Oxytropis podocarpa</i> , Gray.	*			*
" <i>campestris</i> , Linn., <i>var. cærulea</i> , Koch.	*			*
<i>Hedysarum boreale</i> , Nutt.	*			*
<i>Vicia Cracca</i> , Linn.			*	*
" <i>Americana</i> , Muhl.	*		*	*
<i>Lathyrus maritimus</i> , Bigel.	*	*	*	*
" <i>paluster</i> , Linn.	*	*	*	*
ROSACEÆ.				
<i>Prunus Pennsylvanica</i> , Linn.	*	*	*	*
<i>Spiræa salicifolia</i> , Linn.	*	*	*	*

	1.	2.	3.	4.
ROSACEÆ—Continued.				
<i>Rubus Chamæmorus</i> , Linn.	*	*	*	*
" <i>arcticus</i> , Linn.	*	*	*	*
" " var. <i>grandiflorus</i> , Ledeb.	*	*	*	*
" <i>triflorus</i> , Rich.	*	*	*	*
" <i>strigosus</i> , Michx.	*	*	*	*
<i>Dryas octopetala</i> , Linn.	*	*	*	*
" " var. <i>integrifolia</i> , Cham. Sch.	*	*	*	*
<i>Geum macrophyllum</i> , Willd.	*	*	*	*
" <i>strictum</i> , Linn.	*	*	*	*
" <i>rivale</i> , Linn.	*	*	*	*
" <i>triflorum</i> , Pursh.	*	*	*	*
<i>Sibbaldia procumbens</i> , Linn.	*	*	*	*
<i>Fragaria Virginiana</i> , Ehrh.	*	*	*	*
<i>Potentilla Norvegica</i> , Linn.	*	*	*	*
" <i>arguta</i> , Pursh.	*	*	*	*
" <i>Pennsylvanica</i> , Linn.	*	*	*	*
" <i>nivea</i> , Linn.	*	*	*	*
" <i>maculata</i> , Poir.	*	*	*	*
" <i>emarginata</i> , Pursh.	*	*	*	*
" <i>palustris</i> , Scop.	*	*	*	*
" <i>fruticosa</i> , Linn.	*	*	*	*
" <i>tridentata</i> , Sol.	*	*	*	*
" <i>anserina</i> , Linn.	*	*	*	*
<i>Alchemilla vulgaris</i> , Linn.	*	*	*	*
<i>Poterium Canadense</i> , Benth and Hook.	*	*	*	*
<i>Rosa Sayi</i> , Schwein.	*	*	*	*
<i>Pyrus Americana</i> , DC.	*	*	*	*
<i>Amelanchier Canadensis</i> , T. and G., var. <i>oblongifolia</i> , T. and G.	*	*	*	*
" " " <i>oligocarpa</i> , T. and G.	*	*	*	*
SAXIFRAGACEÆ.				
<i>Saxifraga oppositifolia</i> , Linn.	*	*	*	*
" <i>Aizoon</i> , Jacq.	*	*	*	*
" <i>crispitosa</i> , Linn.	*	*	*	*
" <i>rivularis</i> , Linn.	*	*	*	*
" <i>cernua</i> , Linn.	*	*	*	*
" <i>nivalis</i> , Linn.	*	*	*	*
" <i>hieracifolia</i> , Waldst. and Kit.	*	*	*	*
" <i>Hirculus</i> , Linn.	*	*	*	*
" <i>tricuspidata</i> , Retz.	*	*	*	*
" <i>aizoides</i> , Linn.	*	*	*	*
<i>Mitella nuda</i> , Linn.	*	*	*	*
<i>Parnassia palustris</i> , Linn.	*	*	*	*
" <i>parviflora</i> , Linn.	*	*	*	*
" <i>Kotzebuei</i> , Cham. and Schlecht.	*	*	*	*
<i>Ribes oxycanthoides</i> , Linn.	*	*	*	*
" <i>lacustris</i> , Poir.	*	*	*	*
" <i>rubrum</i> , Linn.	*	*	*	*
" <i>prostratum</i> , L'Her.	*	*	*	*
CRASSULACEÆ.				
<i>Sedum Rhodiola</i> , DC.	*	*	*	*
DROSERACEÆ.				
<i>Drosera rotundifolia</i> , Linn.	*	*	*	*
" <i>intermedia</i> , Drev. and Hayne, var. <i>Americana</i> , DC.	*	*	*	*

	1.	2.	3.	4.
HALORAGÆÆ.				
<i>Hippuris vulgaris</i> , Linn.....	*		*	*
<i>Myriophyllum spicatum</i> , Linn.....				*
ONAGRACEÆ.				
<i>Circæa alpina</i> , Linn.....				*
<i>Epilobium spicatum</i> , Lam. (<i>E. angustifolium</i> , Linn.).....	*	*	*	*
" <i>latifolium</i> , Linn.....	*	*		*
" <i>anagallidifolium</i> , Lam. (<i>E. alpinum</i> of Packard's list).....	*	*		*
" <i>palustre</i> , Linn.....	*	*		*
" <i>linzæ</i> , Muhl.....		*	*	*
" <i>adenocaulon</i> , Hausskn. (<i>E. tetragonum</i> of Lake Mias- sassin list).....		*	*	*
UMBELLIFERÆ.				
<i>Sanicula Martlandica</i> , Linn.....			*	*
<i>Sium cicutifolium</i> , Gmelin.....			*	*
<i>Cicuta maculata</i> , Linn.....			*	*
" <i>bulbifera</i> , Linn.....			*	*
<i>Ligusticum Scoticum</i> , Linn.....			*	*
<i>Archangelica scopulorum</i> , Hoffm.....			*	*
" <i>Gmelini</i> , DC.....			*	*
<i>Hernacleum lanatum</i> , Michx.....			*	*
ARALIACEÆ.				
<i>Aralia hispida</i> , Michx.....			*	*
" <i>nudicaulis</i> , Linn.....			*	*
COMACEÆ.				
<i>Cornus Canadensis</i> , Linn.....	*	*	*	*
" <i>suecica</i> , Linn.....	*	*	*	*
" <i>sericea</i> , Linn.....		*	*	*
" <i>stolonifera</i> , Michx.....		*	*	*
CAPRIFOLIACEÆ.				
<i>Sambucus racemosa</i> , Linn., var. <i>pubens</i> , Wat.....			*	*
<i>Viburnum pauciflorum</i> , Fyfe.....	*	*	*	*
<i>Linnaea borealis</i> , Gronov.....	*	*	*	*
<i>Lonicera involucrata</i> , Banks.....	*	*	*	*
" <i>cerulea</i> , Linn.....	*	*	*	*
<i>Diervilla trifida</i> , Moench.....			*	*
RUBIACEÆ.				
<i>Galium asprellum</i> , Michx.....		*	*	*
" <i>trifidum</i> , Linn.....		*	*	*
" <i>triflorum</i> , Michx.....		*	*	*
" <i>boreale</i> , Linn.....		*	*	*
VALERIANACEÆ.				
<i>Valeriana sylvatica</i> , Rich.....			*	*
COMPOSITÆ.				
<i>Eupatorium purpureum</i> , Linn.....			*	*
<i>Solidago bicolor</i> , Linn., var. <i>concolor</i> , Torr. and Gray.....			*	*

	1.	2.	3.	4.
COMPOSITÆ—Continued.				
<i>Solidago multiradiata</i> , Pursh.....	*	*	*
" <i>Virgaurea</i> , Linn. var. <i>alpina</i> , Bigel.....	*
" <i>humilis</i> , Pursh.....	*
" <i>uliginosa</i> , Nutt.....	*	*
" <i>Canadensis</i> , Linn.....	*	*
" <i>memoralis</i>	*	*
" <i>lanceolata</i> , Linn.....	*
<i>Aster radula</i> , Ait.....	*	*
" var. <i>strictus</i> , Gray.....
" <i>levis</i> , Linn.....	*
" <i>Lindleyanus</i> , T. and G.....	*
" <i>salicifolius</i> , Ait.....	*	*
" <i>punctatus</i> , Linn.....	*	*
" <i>paniculatus</i> , Lam.....	*	*
" <i>juncus</i> , Ait.....	*	*
" <i>memoralis</i> , Ait.....	*	*
" <i>umbellatus</i> , Mill.....	*	*
<i>Erigeron hyssopifolius</i> , Michx.....	*	*
" <i>uniflorus</i> , Linn.....	*	*
" <i>Philadelphicus</i> , Linn.....	*	*
" <i>acris</i> , Linn.....	*	*
" var. <i>Drebachensis</i> , Blytt.....	*	*
" <i>Canadensis</i> , Linn.....	*	*
<i>Antennaria plantaginifolia</i> , Hook.....	*	*
" <i>dicica</i> , Gærtn.....	*	*
" <i>alpina</i> , Gærtn.....	*	*
" <i>Carpathica</i> , R. Br.....	*	*
<i>Anaphalis margaritacea</i> , Benth. and Hook.....	*	*
<i>Gnaphalium Norvegicum</i> , Gunner.....	*
" <i>supinum</i> , Vill.....	*
<i>Bidens frondosa</i> , Linn.....	*	*
" <i>cernua</i> , Linn.....	*	*
<i>Chrysanthemum arcticum</i> , Linn.....	*	*
<i>Achillea Millefolium</i> , Linn.....	*	*
<i>Tanacetum Huronense</i> , Nutt.....	*	*
<i>Artemisia borealis</i> , Pall., var. <i>spithamea</i> , T. and G.....	*
" " " <i>Wormskioldii</i> , Bess.....	*	*
" <i>Canadensis</i> , Michx.....	*	*
<i>Petasites palmata</i> , Gray.....	*	*
" <i>sagittata</i> , Gray.....	*	*
<i>Arnica alpina</i> , Murr.....	*	*
<i>Senecio vulgaris</i> , Linn.....	*	*
" <i>abreus</i> , Linn.....	*	*
" " var. <i>Balsamifera</i> , Torr. and Gray.....	*	*
" " " <i>borealis</i> , Torr. and Gray.....	*	*
" " " <i>obovatus</i> , Torr. and Gray.....	*	*
" <i>Pseudo-Arnica</i> , Less.....	*	*
" <i>frigidus</i> , Less.....	*
<i>Cnicus muticus</i> , Pursh.....	*	*
<i>Hieracium vulgatum</i> , Fries.....	*	*
" <i>umbellatum</i> , Linn.....	*	*
" <i>scabrum</i> , Michx.....	*	*
<i>Taraxacum officinale</i> , Weber.....	*	*
" " var. <i>alpinum</i> , Koch.....	*	*
" " " <i>lividum</i> , Koch.....	*
<i>Lactuca leucophylla</i> , Gray.....	*	*
" <i>pulchella</i> , DC.....	*	*
<i>Prenanthes alba</i> , Linn.....	*	*
" <i>racemosa</i> , Hook.....	*	*

	1.	2.	3.	4.
LOBELIACEÆ.				
<i>Lobelia Dortmanna</i> , Linn.....			*	*
" <i>Kalmii</i> , Linn.....			*	*
CAMPANULACEÆ.				
<i>Campanula rotundifolia</i> , Linn.....		*	*	*
" " var. <i>arctica</i> , Lange.....		*		*
" <i>uniflora</i> , Linn.....		*		
VACCINIACEÆ.				
<i>Vaccinium Pennsylvanicum</i> , Lam.....			*	
" " var. <i>angustifolium</i> , Gray.....		*	*	
" <i>Canadense</i> , Kalm.....		*	*	*
" <i>uliginosum</i> , Linn.....		*	*	*
" <i>caespitosum</i> , Michx.....		*	*	*
" <i>Vitis-Idæa</i> , Linn.....		*	*	*
" <i>Oxycoccus</i> , Linn. (<i>Oxycoccus vulgaris</i> , Pursh.).....		*	*	*
" <i>macrocarpon</i> , Ait. (<i>Oxycoccus macrocarpus</i> , Pursh.).....		*	*	*
<i>Chiogenes hispida</i> , Torr. and Gray.....		*	*	*
ERICACEÆ.				
<i>Arctostaphylos alpina</i> , Spreng.....		*	*	*
" <i>Uva-ursi</i> , Spreng.....		*	*	*
<i>Cassandra calyculata</i> , Don.....		*	*	*
<i>Cassiope hypnoides</i> , Don.....		*	*	*
" <i>tetragona</i> , Don.....		*	*	*
<i>Epigæa repens</i> , Linn.....		*	*	*
<i>Andromeda polifolia</i> , Linn.....		*	*	*
<i>Loiseleuria procumbens</i> , Desv.....		*	*	*
<i>Bryanthus taxifolius</i> , Gray.....		*	*	*
<i>Kalmia angustifolia</i> , Linn.....		*	*	*
" <i>glauca</i> , Ait.....		*	*	*
<i>Ledum palustre</i> , Linn.....		*	*	*
" <i>latifolium</i> , Ait.....		*	*	*
<i>Rhododendron Rhodora</i> , Don.....		*	*	*
" <i>Lapponicum</i> , Wahl.....		*	*	*
<i>Pyrola minor</i> , Linn.....		*	*	*
" <i>secunda</i> , Linn.....		*	*	*
" " var. <i>pumila</i> , Gray.....		*	*	*
" <i>chlorantha</i> , Swartz.....		*	*	*
" <i>rotundifolia</i> , Linn.....		*	*	*
" " var. <i>uliginosa</i> , Gray.....		*	*	*
" " " <i>pumila</i> , Hook.....		*	*	*
<i>Moneses uniflora</i> , Gray.....		*	*	*
DIAPENSACEÆ.				
<i>Diapensia Lapponica</i> , Linn.....		*	*	
PLUMBAGINACEÆ.				
<i>Armeria vulgaris</i> , Willd.....		*		*
PRIMULACEÆ.				
<i>Primula farinosa</i> , Linn.....		*	*	*
" <i>Miatassonica</i> , Michx.....		*	*	*
" <i>Egalikensis</i> , Hornem.....		*	*	*
<i>Trientalis Americana</i> , Pursh.....		*	*	*
<i>Lysimachia stricta</i> , Ait.....		*	*	*

	1.	2.	3.	4.
APOCYNACEÆ.				
<i>Apocynum androsaemifolium</i> , Linn.			*	
GENTIANACEÆ.				
<i>Gentiana serrata</i> , Gunner.			*	*
" <i>Amarella</i> , Linn., var. <i>acuta</i> , Hook.	*	*	*	*
" <i>propinqua</i> , Rich.	*			
" <i>nivalis</i> , Linn.	*			
" <i>linearis</i> , Frel.	*	*		
<i>Pleurogyne rotata</i> , Griseb.	*			*
" <i>Carinthiaca</i> , Griseb., var. <i>pusilla</i> , Gray.	*			
<i>Halenia deflexa</i> , Griseb.	*			
<i>Menyanthes trifoliata</i> , Linn.	*	*	*	*
BORRAGINACEÆ.				
<i>Myosotis verna</i> , Nutt.			*	
<i>Mertensia maritima</i> , Don.	*			*
" <i>paniculata</i> , Don.				*
SCROPHULARIACEÆ.				
<i>Mimulus ringens</i> , Linn.			*	
<i>Veronica alpina</i> , Linn.	*	*		
" <i>scutellata</i> , Linn.				
" <i>Americana</i> , Schwein.			*	
" <i>peregrina</i> , Linn.			*	
<i>Castilleja pallida</i> , Kunth.			*	
" var. <i>septentrionalis</i> , Gray.	*	*	*	*
<i>Euphrasia officinalis</i> , Linn.	*	*	*	*
" var. <i>Tartarica</i> , Benth.	*	*	*	*
<i>Bartsia alpina</i> , Linn.	*	*	*	*
<i>Pedicularis Grenlandica</i> , Retz.	*	*	*	*
" <i>Laponica</i> , Linn.	*	*	*	*
" <i>euphrasioides</i> , Stephan.	*	*	*	*
" <i>palustris</i> , Linn., var. <i>Wlassoviana</i> , Bunge.	*	*	*	*
" <i>hirsuta</i> , Linn.	*	*	*	*
" <i>flammea</i> , Linn.	*	*	*	*
<i>Rhinanthus Crista-galli</i> , Linn.	*	*	*	*
<i>Melanampyrum Americanum</i> , Michx.	*	*	*	*
LENTIBULARIACEÆ.				
<i>Utricularia vulgaris</i> , Linn., var. <i>Americana</i> , Gray.			*	
" <i>intermedia</i> , Hayne.	*	*	*	*
<i>Pinguicula vulgaris</i> , Linn.	*	*	*	*
" <i>villosa</i> , Linn.	*	*	*	*
" <i>alpina</i> , Linn.	*	*	*	*
LABIATÆ.				
<i>Mentha Canadensis</i> , Linn.		*	*	*
" var. <i>glabrata</i> , Benth.		*	*	*
<i>Lycopus sinuatus</i> , Ell.		*	*	*
<i>Dracocephalum parviflorum</i> , Nutt.		*	*	*
<i>Brunella vulgaris</i> , Linn.		*	*	*
<i>Scutellaria galericulata</i> , Linn.		*	*	*
" <i>lateriflora</i> , Linn.		*	*	*
<i>Lamium amplexicaule</i> , Linn.		*	*	*
<i>Galeopsis Tetrahit</i> , Linn.		*	*	*
<i>Stachys palustris</i> , Linn.		*	*	*

	1.	2.	3.	4.
PLANTAGINACEÆ.				
<i>Plantago major</i> , Linn.		*	*	*
" <i>eripoda</i> , Torr.				*
" <i>maritima</i> , Linn.		*		*
CHENOPODIACEÆ.				
<i>Chenopodium album</i> , Linn.		*	*	*
POLYGONACEÆ.				
<i>Polygonum aviculare</i> , Linn.	*	*	*	*
" " var. <i>borealis</i> , Lange. (new to Canada)			*	*
" <i>amphibium</i> , Linn.			*	*
" <i>cilonode</i> , Michx.			*	*
" <i>Convolvulus</i> , Linn.			*	*
" <i>viviparum</i> , Linn.	*	*	*	*
" <i>lapathifolium</i> , Ait., var., <i>incanum</i> , Hook.			*	*
<i>Oxyria digyna</i> , Camp.	*			*
<i>Rumex verticillatus</i> , Linn.				*
" <i>occidentalis</i> , Wat.	*			*
" <i>maritimus</i> , Linn.				*
<i>Koenigia Islandica</i> , Linn.	*			*
ELÆAGNACEÆ.				
<i>Elæagnus argentea</i> , Pursh.				*
<i>Spehlerdia Canadensis</i> , Nutt.				*
SANTALACEÆ.				
<i>Comandra livida</i> , Rich.	*	*	*	*
URTICACEÆ.				
<i>Urtica gracilis</i> , Ait.			*	*
MYRICACEÆ.				
<i>Myrica Gale</i> , Linn.		*	*	*
BETULACEÆ.				
<i>Betula lutea</i> , Michx.			*	*
" <i>papyrifera</i> , Michx.	*	*	*	*
" <i>pumila</i> , Linn.	*	*	*	*
" <i>glandulosa</i> , Michx.	*	*	*	*
" <i>nana</i> , Linn.	*	*	*	*
<i>Alnus incana</i> , Willd.	*	*	*	*
" <i>viridis</i> , DC.	*	*	*	*
SALICACEÆ.				
<i>Salix adenophylla</i> , Hook.	*			*
" <i>arctica</i> , R. Br.	*	*		*
" <i>argyrocarpa</i> , Anders.	*			*
" <i>balsamifera</i> , Barratt.	*			*
" <i>candida</i> , Willd.	*	*	*	*
" <i>chlorophylla</i> , Anders.	*	*	*	*
" <i>cordata</i> , Muhl.	*	*	*	*
" <i>Gesertorum</i> , Rich.	*	*	*	*
" <i>tricolor</i> , Muhl.	*	*	*	*

	1.	2.	3.	4.
SALICACEÆ.				
<i>Salix glauca</i> , Linn.	*		*	
" <i>herbacea</i> , Linn.	*			
" <i>lucida</i> , Muhl.			*	*
" <i>myrtilloides</i> , Linn.			*	*
" <i>Richardsoni</i> , Hook., var. <i>Macouniana</i> , Bebb.			*	*
" <i>reticulata</i> , Linn.	*			
" <i>rostrata</i> , Rich.			*	*
" <i>vestita</i> , Pursh.	*			
" <i>Uva-ursi</i> , Pursh.	*	*	*	*
<i>Populus tremuloides</i> , Michx.	*			
" <i>balsamifera</i> , Linn.		*	*	*
EMPETRACEÆ.				
<i>Empetrum nigrum</i> , Linn.	*	*	*	*
CONIFERÆ.				
<i>Thuja occidentalis</i> , Linn.			*	*
<i>Juniperus communis</i> , Linn.			*	*
" " var. <i>alpina</i> , Linn.	*			
<i>Taxus baccata</i> , Linn., var. <i>Canadensis</i> , Gray.		*	*	*
<i>Pinus Banksiana</i> , Lamb.		*	*	*
<i>Picea alba</i> , Link.	*	*	*	*
" <i>nigra</i> , Link.	*	*	*	*
<i>Abies balsamea</i> , Marsh.	*	*	*	*
<i>Larix Americana</i> , Michx.	*	*	*	*
ORCHIDACEÆ.				
<i>Calypso borealis</i> , Salisb.			*	
<i>Corallorhiza innata</i> , R. Br.			*	
<i>Listera cordata</i> , R. Br.	*	*	*	*
" <i>convallarioides</i> , Nutt.			*	*
<i>Spiranthes Romanzoviana</i> , Cham.		*	*	*
<i>Goodyera repens</i> , R. Br.		*	*	*
<i>Orchis rotundifolia</i> , Gray.		*	*	*
<i>Habenaria hyperborea</i> , R. Br.	*	*	*	*
" <i>obtusata</i> , Rich.	*	*	*	*
" <i>dilatata</i> , Gray.	*	*	*	*
<i>Cypripedium pubescens</i> , Swartz.			*	*
" <i>acule</i> , Ait.			*	*
IRIDACEÆ.				
<i>Iris Hookeri</i> , Penny.	*	*		
" <i>versicolor</i> , Linn.			*	
<i>Sisyrinchium mucronatum</i> , Mx.			*	
LILIACEÆ.				
<i>Streptopus amplexifolius</i> , DC.			*	
" <i>roseus</i> , Michx.	*			
<i>Smilacina stellata</i> , Desf.	*		*	*
" <i>trifolia</i> , Desf.	*		*	*
<i>Mianthemum Canadense</i> , Desf. (<i>M. trifolium</i> of Mistassini list.)	*	*	*	*
<i>Allium schenoprasum</i> , Linn.			*	*
<i>Tofieldia borealis</i> , Wabl. (<i>T. palustris</i> , Huds.)	*		*	*
" <i>glutinosa</i> , Willd.	*	*	*	*
<i>Clintonia borealis</i> , Raf.	*		*	

	1.	2.	3.	4.
JUNCACEÆ.				
<i>Juncus filiformis</i> , Linn.			*	*
" <i>Balticus</i> , Willd., var. <i>littoralis</i> , Engel.			*	*
" <i>triglumis</i> , Linn.	*			*
" <i>effusus</i> , Linn.	*			*
" <i>castaneus</i> , Smith			*	*
" <i>tenuis</i> , Willd.			*	*
" <i>bufonius</i> , Linn.			*	*
" <i>alpinus</i> , Villars, var. <i>insignis</i> , Fries.			*	*
" <i>nodosus</i> , Linn.			*	*
" <i>Canadensis</i> , J. Gay, var. <i>coarctatus</i> , Engelm.			*	*
<i>Luzula spadicæ</i> , DC.			*	*
" " var. <i>parviflora</i> , Meyer.	*			*
" <i>spicata</i> , Desv.			*	*
" <i>comosa</i> , Meyer.			*	*
" <i>arcuata</i> , Meyer.	*			*
TYPHACEÆ.				
<i>Sparganium simplex</i> , Huds.	*		*	*
" <i>hypnoidum</i> , Lest., var. <i>Americanum</i> , Beeby.	*		*	*
AROIDÆ.				
<i>Calla palustris</i> , Linn.			*	*
LEMNACEÆ.				
<i>Lemna minor</i> , Linn.				*
ALISMACEÆ.				
<i>Sagittaria variabilis</i> , Engelm.			*	*
NAIDACEÆ.				
<i>Triglochin palustre</i> , Linn.	*		*	*
" <i>maritimum</i> , Linn.	*		*	*
<i>Potamogeton heterophyllus</i> , Schreb. (Includes two varieties of <i>P. gramineus</i> in Mistassini list.)			*	*
" <i>pauciflorus</i> , Pursh			*	*
" <i>pectinatus</i> , Linn.			*	*
" <i>marinus</i> , Linn.			*	*
" <i>perfoliatus</i> , Linn.			*	*
" <i>pusillus</i> , Linn.			*	*
" <i>rutilans</i> , Wolfgang.			*	*
" <i>rufescens</i> , Schrad.			*	*
<i>Najas flexilis</i> , Rostk.			*	*
<i>Zannichellia palustris</i> , Linn.			*	*
CYPERACEÆ.				
<i>Eleocharis palustris</i> , R. Br.			*	*
<i>Scirpus lacustris</i> , Linn. (<i>S. validus</i> , Vahl.)			*	*
" <i>sylvaticus</i> , Linn., var. <i>digynus</i> , Beck. (<i>S. microcarpus</i> , Presl.)			*	*
" <i>caespitosus</i> , Linn.	*	*	*	*
" <i>atrovirens</i> , Muhl.			*	*
<i>Eriophorum alpinum</i> , Linn.			*	*
" <i>cyperium</i> , Linn.			*	*
" <i>vaginatum</i> , Linn.	*	*	*	*
" <i>russeolum</i> , Fries.	*	*	*	*

	1.	2.	3.	3.
CYPERACEÆ—Continued.				
<i>Eriophorum capitatum</i> , Host. (<i>E. Scheuchzeri</i> , Hoppe.)	*			*
" <i>polystachyon</i> , Linn.		*		
" " <i>gracile</i> , Koch.			*	
" " var. <i>angustifolium</i> , Gray			*	
<i>Carex ambusta</i> , Boott		*		
" <i>adusta</i> , Boott.			*	
" <i>aquililis</i> , Wahl. (<i>C. angustata</i> of Mistassini list.)		*		
" <i>alpina</i> , Swartz			*	
" <i>arctata</i> , Boott., var. <i>Faxonii</i> , Bailey			*	
" <i>atrata</i> , Linn.			*	
" <i>aurea</i> , Nutt.			*	
" <i>Buxbaumii</i> , Wahl.			*	
" <i>canescens</i> , Linn.			*	
" " var. <i>alpicola</i> , Wahl.			*	
" " " <i>vulgaris</i> , Bailey			*	
" <i>capillaris</i> , Linn.			*	
" <i>castanea</i> , Wahl. (<i>C. flexilis</i> , Rudge.)			*	
" <i>chordorrhiza</i> , Ehrh.			*	
" <i>conclina</i> , R. Br.			*	
" <i>echinata</i> , Murr.			*	
" <i>Gmelini</i> , Hook.			*	
" <i>gyocrates</i> , Wormsk.			*	
" <i>flava</i> , Linn.			*	
" <i>lagopina</i> , Wahl.			*	
" <i>lanuginosa</i> , Michx.			*	
" <i>lenticularis</i> , Michx.			*	
" <i>laxiflora</i> , Lam.			*	
" <i>limosa</i> , Linn.			*	
" <i>maritima</i> , Vahl.			*	
" <i>Magellonica</i> , Lam.			*	
" <i>microglochin</i> , Wahl.			*	
" <i>miliaris</i> , Michx.			*	
" <i>Michauxiana</i> , Beckl.			*	
" <i>monile</i> , Tuck.			*	
" <i>nardina</i> , Fries.			*	
" <i>(Ederi, Ehrh. (C. flava, L., var. ciridula, Bail.)</i>			*	
" <i>oligosperma</i> , Michx.			*	
" <i>polytrichoides</i> , Muhl.			*	
" <i>p. atensis</i> , Drog.			*	
" <i>cariflora</i> , Smith.			*	
" <i>riparia</i> , W. Curtis.			*	
" <i>rotundata</i> , Wahl.			*	
" <i>scirpoides</i> , Michx.			*	
" <i>salina</i> , Wahl.			*	
" <i>saxatilis</i> , Linn.			*	
" <i>scoparia</i> , Schk.			*	
" <i>straminea</i> , Willd.			*	
" <i>stricta</i> , Lam., var. <i>decora</i> , Bail.			*	
" <i>teretiuscula</i> , Good.			*	
" <i>utriculata</i> , Boott. (<i>C. rostrata</i> of lists.)			*	
" <i>vaginata</i> , Tausch.			*	
" <i>vulgaris</i> , Fries., var. <i>hyperborea</i> , Boott.			*	
GRAMINEÆ.				
<i>Beckmannia eruceiformis</i> , Host., var. <i>uniflorus</i> , Scrib.			*	
<i>Panicum dichotomum</i> , Linn.			*	
<i>Hierochloa alpina</i> , Rost. and Schultz.			*	
" <i>borealis</i> , Rost. and Schultz.			*	
<i>Alopecurus geniculatus</i> , Linn., var. <i>aristulatus</i> , Munro.			*	
" <i>alpinus</i> , Smith.			*	

	1.	2.	3.	4.
GRAMINEÆ—Concluded.				
<i>Stipa Richardsonii</i> , Link.			*	
<i>Oryzopsis asperifolia</i> , Michx.			*	
<i>Phleum pratense</i> , Linn.			*	
" <i>alpinum</i> , Linn.			*	
<i>Agrostis scabra</i> , Willd.			*	
<i>Cinna pendula</i> , Trin.			*	
<i>Calamagrostis Canadensis</i> , Hook.			*	
" <i>neglecta</i> , Kunth.			*	
" <i>Langsdorfii</i> , Trin.			*	
<i>Deschampsia atropurpurea</i> , Scheele.			*	
" " var. <i>minor</i> , Vasey.			*	
" <i>crispitosa</i> , Beauv.			*	
" <i>alba</i> , Rost. and Schult. (<i>D. flexuosa</i> of Mistassini list.)			*	
<i>Trisetum subspicatum</i> , Beauv., var. <i>molle</i> , Gray.			*	
<i>Catabrosa aquatica</i> , Beauv.			*	
<i>Poa alpina</i> , Linn.			*	
" <i>caesia</i> , Smith.			*	
" <i>caesia</i> , All.			*	
" <i>glumaris</i> , Trin.			*	
" <i>pratensis</i> , Linn.			*	
<i>Glyceria Canadensis</i> , Trin.			*	
" <i>arundinacea</i> , Kunth.			*	
" <i>nervata</i> , Trin.			*	
<i>Festuca ovina</i> , Linn.			*	
" " var. <i>brevifolia</i> , Wats.			*	
<i>Bromus ciliatus</i> , Linn.			*	
<i>Agropyrum tenerum</i> , Vasey.			*	
" <i>violaceum</i> , La ge.			*	
<i>Hordeum jubatum</i> , Linn.			*	
<i>Elymus mollis</i> , Trin.			*	
EQUISETACEÆ.				
<i>Equisetum arvense</i> , Linn.		*	*	*
" <i>pratense</i> , Linn.		*	*	*
" <i>sylvaticum</i> , Linn.		*	*	*
" <i>palustre</i> , Linn.		*	*	*
" <i>scirpoides</i> , Michx.		*	*	*
OPHIOGLOSSACEÆ.				
<i>Botrychium Lunaria</i> , Swartz.		*	*	*
" <i>Virginicum</i> , Swartz.		*	*	*
" <i>ternatum</i> , Swartz., var. <i>lunarioides</i> , Milde.		*	*	*
FILICES.				
<i>Polypodium vulgare</i> , Linn.			*	
<i>Pellaea gracilis</i> , Hook.			*	
<i>Pteris aquilina</i> , Linn.			*	
<i>Asplenium viride</i> , Huds.			*	
" <i>Felix-femina</i> , Bernh.			*	
<i>Phlegopteris Dryopteris</i> , Fée.			*	
" " var. <i>Robertianum</i> , Dav. (<i>P. calcarea</i> , Fée.)			*	
" <i>polypodioides</i> , Fée.			*	
<i>Aspidium spinulosum</i> , Swartz., var. <i>dilatatum</i> , Hook.			*	
<i>Onoclea sensibilis</i> , Linn.			*	
<i>Cystopteris fragilis</i> , Bernh.			*	
" <i>montana</i> , Bernh.			*	

	1.	2.	3.	4.
FILICES—Concluded.				
<i>Woodsia glabella</i> , R. Br.			•	•
" <i>Ilvensis</i> , R. Br.			•	•
<i>Osmunda regalis</i> , Linn.			•	•
" <i>Claytoniana</i> , Linn.			•	•
LYCOPODIACEÆ.				
<i>Lycopodium Selago</i> , Linn.	•		•	•
" <i>lucidulum</i> , Michx.	•			
" <i>annotinum</i> , Linn.			•	•
" <i>obscurum</i> , Linn. (<i>L. dendroideum</i> , Mx.).			•	•
" <i>clavatum</i> , Linn.			•	•
" <i>sabinefolium</i> , Hook.			•	•
" <i>complanatum</i> , Linn.			•	•

APPENDIX VII.

METEOROLOGICAL OBSERVATIONS IN THE LABRADOR PENINSULA, 1893-1894 and 1895 BY D. I. V. EATON.

The barometer used was a small aneroid, but the readings have been corrected, and are believed to be nearly exact.

The temperature is stated in degrees Fahrenheit.

The force of the wind is estimated according to a scale from 0 to 5.

The proportion of the sky covered by clouds is estimated by a scale from 0 to 10; 0 being a cloudless sky, 10 a completely clouded sky. The character of the clouds is denoted by the usual letter or combination of letters referring to Howard's classification.

The letters used in the last column have the following designations: B. blue sky; C. cloudy; R. rain; G. gloomy; F. fog; O. overcast; H. haze.

NOTE—The observations taken between 20th June and 13th August, 1893, were lost through the upset of a canoe. The last thermometer was broken on 18th June, 1894.

APPEN

METEOROLOGICAL OBSERVATIONS in the

Place.	Date.	Thermometer.			Minimum.	Barometer.		
		7	2	9		7	2	9
	1893.							
Kaniapieskan Lake...	Aug. 14	31	70	61		28.16	28.16	28.19
Upper Koksoak River...	" 15	58	65	61		28.19	28.21	28.25
" 16	" 16	50	70	55		28.21	28.35	28.48
" 17	" 17	40	75	65		28.48	28.54	28.62
" 18	" 18	50	75	65		28.62	28.77	28.98
Koksoak River	" 19	36	76	58		29.06	29.11	29.12
" 20	" 20	50	75	62		29.17	29.23	29.26
" 21	" 21	54	68	54		29.28	29.41	29.36
" 22	" 22	44	72	65		29.39	29.15	29.22
" 23	" 23	62	53	50		29.16	29.14	29.09
" 24	" 24	60	63	55		29.30	29.30	29.40
" 25	" 25	38	64	55		29.46	29.44	29.56
" 26	" 26	64	65	56		29.69	29.74	29.68
Fort Chimo	" 27	55	70	64		29.46	29.41	29.50
" 28	" 28	62	70	58		29.52	29.56	29.64
" 29	" 29	46	52	50		29.76	29.84	29.94
" 30	" 30	48	42	40		29.80	29.92	29.92
" 31	" 31	46		44		29.86		29.84
" Sept. 1	Sept. 1	46	66	55		29.76	29.66	29.56
" 2	" 2	49	72	56		29.54	29.42	29.42
" 3	" 3	54	50	40		29.46	29.46	29.50
" 4	" 4	40	61	47	32	29.53		29.44
" 5	" 5	50	59	50	42	29.40	29.39	29.45
" 6	" 6	46	48	48		29.65	29.72	29.76
" 7	" 7	45	54	40	40	29.84	29.82	29.76
" 8	" 8	42	56	38	33	29.79	29.83	29.86
" 9	" 9	36	45	38		29.80	29.90	29.91
Ungava Bay...	" 10	35	54			29.92	29.96	29.94
George River Post...	" 11	42	44	42		30.00	30.04	30.04
" 12	" 12	54	58	55		29.64	29.64	29.41
" 13	" 13	55		54		29.41		29.54
Ungava Bay...	" 14	65		48		29.42		29.40
" 15	" 15	48		43		29.18		30.02
" 16	" 16	36		43		29.87		29.80
Fort Chimo	" 17	63		64		29.72		29.62
" 18	" 18	62				29.62		
Ungava Bay...	" 19	55				29.60		
" 20	" 20	43		50		29.52	29.55	29.64
Port Burwell...	" 21	45		43		29.64		29.81
" 22	" 22	45		40		29.70		29.61
" 23	" 23	40		42		29.25		29.25
Nachvak Bay...	" 24	42		40		29.52		29.40
" 25	" 25	46		40		29.15		29.20
" 26	" 26	43		40		29.29		29.30
Davis Inlet	" 27	45		38		29.64		29.90

DIX VII—(Cont.)

Labrador Peninsula, 1893-1894.

Wind.												Notes on weather during last 24 hours.
Direction.			Force.			Clouds.						
7	2	9	7	2	9	7	2	9				
N.E.	E.	N.E.	2	3	2	3 K.	2 K.	3 K. + C.				Clear, passing clouds.
	N.					4 K. S.	6 K. S.	9 K. S.				Overcast towards night.
	S.W.					6 K.	5 K. S.	2 K.				C. B.
	S.E.	S.E.	1	2		3 K. S.	3 K.	4 K.				C. B., mist.
S.E.	N.E.		2	2		3 C.	3 K.	2 K.				B. C.
						3 K.	2 K.	3 K. S.				B. C.
							3 K.	3 K. S.				B. B.
S.E.	N.W.		2	3		5 C. + K. S.	10 K. S.	1 K.				B., overcast.
	S.W.					3 K.	8 K. + C.	9 K. + C.				C., dull.
S.			2			9 C.	N.	N.				Heavy showers, dull and gloomy.
S.			1	2		N.	10 K. S.	8 K. S.				Rain, overcast and dull.
	N.	N.	3	2		2 K.	8 K. S.	8 K.				C. B.
	S.					8 K.	6 K. S.	7 K. S.				O. dull.
E.	S.		2	3		8 K. + C.	4 C. + 3 K.	6 K. S.				C. B.
		E.				5 K. S.	5 K. S.	8 K.				C. B.
E.		N.E.	2	2		6 K. S.	7 K.	8 K.				Smoky, C.
						5 K. S.	5 K. S.	1 K.				C. B.
						1 K.	1 K.	K.				Bright and clear.
		N.E.				1 K.	1 K.	K.				B.
		N.				K.	2 K.	2 K.				B.
		N.				7 K. + C.		10 K. S.				Hazy, overcast at night.
						9 K. S.		8 K. + 1 C.				C. B.
	N.W.	N.W.	2	2		8 K. S.	6 K. S.	7 K. S.				Rain at night.
W.N.W.	E.	N.E.	3	12		8 K.	7 K.	6 S. + C.				C. B.
	N.	N.				8 K.	5 K.	9 K. S.				Dull and gloomy.
	N.E.	N.E.	2	1		8 K.	7 K.	8 K. S.				C. B.
N.E.	N.E.	N.E.	2	12		8 K. S.	5 K.	5 K. + C.				Fog, dull and threatening.
N.E.	W.	W.	2	12		10 K.	10 K.	5 K.				C.
	S.E.	S.E.				8 K. S.	6 K.	7 K. S.				Overcast and dull.
			2	1		7 K. S.		4 K. S.				C. B.
	S.W.					6 K.		7 K.				Light showers.
	S.E.	S.E.	2	12		10 K.		7 K.				C.
						8 K. S.		10 K. S.				C. and fog.
						4 K.		4 K.				Rain.
						4 K.		7 K.				Dull.
	S.E.	S.E.	2			10 K.						Mist.
						10 K.		6 K. S.				O. dull.
			3			10 K.		8 K. S.				O., mist.
	W.		2	2		8 K. S.		6 K.				O., dull.
	E.		2	2		6 K.		7 K.				Fog.
	S.E.		2	3		8 K. S.		7 K. S.				Overcast, fog.
	S.E.		2	1		2 K.		6 K. S.				B. C.
	S.E.		2	2		10 K. S.		6 K. S.				Fog, C. B.
	N.	N.	3	3		10 K. S.		6 K. S.				C. B.
N.W.	N.W.	N.W.	3	2		5 K.		4 K.				C. B.

METEOROLOGICAL OBSERVATIONS in the

Place.	Date.	Thermometer.			Minimum.	Barometer.		
	1893.	7	2	9		7	2	9
	Sept. 28	40	42	42		30.04	30.14	30.14
	" 29	48	40	40		30.14		30.15
	" 30	45	44	44		30.14		30.22
Rigolet	Oct. 1	42	48	40		30.32	30.00	29.97
"	" 2	39	49	40		29.91	29.80	29.70
"	" 3	43	50	41		29.65	29.72	29.90
"	" 4	46	56	41		29.87	29.85	29.99
"	" 5	35	48	39		30.00	30.08	30.08
"	" 6	34	52	40		30.01	29.80	29.75
"	" 7	40	60	41		29.90	29.98	29.94
"	" 8	41	44	42		29.75	29.62	29.60
"	" 9	41	50	43		29.60	29.60	29.63
Hamilton Inlet	" 10	44		49		29.65		29.80
"	" 11	44	45	42		29.90	30.00	30.00
"	" 12	42	48	46		30.20	30.12	30.12
Northwest River, Labrador	" 13	44		44		29.92		30.00
"	" 14	42	48	43		30.00	30.00	30.02
"	" 15	43	54	51		29.56	29.31	29.24
"	" 16	42	49	44		29.31	29.24	29.71
"	" 17	36	42	36		29.90	29.84	29.90
"	" 18	30	36	31		30.10	30.12	30.20
"	" 19	32	38	32		30.20	30.12	30.06
"	" 20	32	40	39		29.85	29.80	29.74
"	" 21	39	52	55		29.60	29.44	29.74
"	" 22	39	40	42		30.10	30.15	30.40
"	" 23	44	46	32		30.70	30.10	30.40
"	" 24	39	48	49		30.22	30.05	29.96
"	" 25	53	53	48		29.66	29.70	29.90
"	" 26	36	45	43		30.00	30.10	30.20
"	" 27	40	47	32		30.40	30.00	30.00
"	" 28	43	45	41		29.89	29.90	29.75
"	" 29	41	42	40		29.62	29.41	29.41
"	" 30	42	44	34		29.72	30.00	30.23
"	" 31	26	27	24		30.32	30.40	30.23
"	Nov. 1	24	27	22		30.20	30.10	30.08
"	" 2	28	37	38		30.00	29.99	29.99
"	" 3	39	43	47		29.92	29.71	29.68
"	" 4	35	36	23		29.77	29.84	30.00
"	" 5	31	36	28		30.00	30.04	30.05
"	" 6	30	23	33		33.00	30.00	29.99
"	" 7	29	34	32		30.16	3.24	30.00
"	" 8	31	35	28		29.80	29.60	29.60
"	" 9	25	33	28		29.52	29.52	29.85
"	" 10	15	20	14		30.04	30.10	30.12
"	" 11	18	25	14		30.20	30.10	30.20
"	" 12	27	27	24		30.29	30.20	30.10
"	" 13	30	36	35		29.95	29.92	29.94
"	" 14	31	31	37		29.96	29.92	29.89
"	" 15	39	40	37		29.68	29.50	29.32
"	" 16	41	40	38		29.62	29.50	29.60
"	" 17	25	27	22		29.10	29.22	29.43
"	" 18	16	33	24		29.44	29.31	29.25
"	" 19	17	19	12		29.43	29.50	29.70
"	" 20	10	17	16		30.05	30.00	29.90

Labrador Peninsula, 1893-1894—Continued.

Wind.					Clouds.					Notes on weather during last 24 hours.
Direction.			Force.							
7	2	9	7	2	9	7	2	9		
N.W.		N.W.	2		4	4 K.		6 K.S.	C. B.	
N.W.		N.W.	2		1	7 K.S.		7 K.S.	C. B.	
N.W.		S.W.	2		1			5 K.	B.	
	S.	S.W.				2 K.	3 K.S.	5 K.	B. C.	
W.		E.	2		2	7 K.C.	6 K.S.	8 K.S.+C.	C. B.	
N.E.	N.	S.W.	2	2	2	9 K.	4 K.S.	6 K.S.	C. B.	
S.E.	S.	W.	2	3	2	7 K.S.	2 S.+C.	2 K.	B. C.	
N.	N.E.	N.	2	2	2	3 K.S.	3 K.+C.	5 K.	B. C.	
N.E.	N.		2	1		5 K.	4 K.S.	3 K.+C.	C. B.	
N.E.	N.	N.	2	1	2	9 K.C.	5 K.S.	6 K.S.	B. C., aurora.	
N.	N.		1			4 K.S.	7 K.	6 K.	O. dull.	
						7 K.S.	5 K.S.	6 K.S.	C. B.	
						N.		10 K.S.	Rain in morning, C. B.	
						6 K.S.	N.	7 K.S.	O. D., showers.	
S.	S.W.	S.W.	2	2	2	8 K.S.	8 K.S.	10 K.S.	C. B., showers.	
		N.W.				8 S.		8 K.S.	C. B.	
N.W.	N.W.	N.W.	1	2	2	8 K.S.	6 K.S.	8 K.	C. B.	
	S.	S.W.	3	3		9 K.S.	10 K.	8 K.	C. B.	
S.W.	S.W.		3	3		7 K.	7 K.	4 K.	B. C.	
	W.				1	7 K.S.	10 K.S.	10 N.	C. B., rain at night.	
W.	W.	W.	2	1	2	8 K.S.	8 K.	4 K.S.	C. B., snow at 9 p.m.	
S.W.	S.W.	W.	2	1	2	10 K.S.	9 K.	9 K.N.	C. B., 1 inch of snow.	
S.W.	S.W.	W.	1	1	1	6 K.C.	7 K.	9 K.	C. B., steady.	
S.W.	S.W.					5 K.	7 K.		C. B.	
S.W.	S.W.					K.S.			B., bright and starry.	
S.	S.	S.W.	2	1		7 K.	8 K.	9 K.S.	B.	
W.	S.W.	S.W.	2	2	3	8 K.	6 K.	6 K.+C.	C. B., rain in early morning.	
N.	N.	N.E.	2	1	2	8 K.S.	6 K.	7 K.+C.	B., fast moving clouds at 9 p.m.	
N.	N.	N.E.	2	1	2	5 K.S.	5 K.S.	4 K.	C. B., showers.	
W.	N.	N.W.	2	2	2	6 K.S.	7 K.C.	3 K.	C. B.	
W.	S.	S.E.	1	2	1	10 K.	6 N.	10 N.	C. B.	
N.E.	N.E.	W.	1	2	2	7 K.	6 N.	5 K.+C.	C. B., showers.	
W.	N.E.		1	3		9 K.+C.	3 K.+C.	9 N.	B. C., bright moonlight.	
N.W.	N.W.	W.	1	2	1	7 K.S.	6 K.	6 K.	C. B., snow.	
W.	N.	W.	2	2	2	8 K.	2 K.	2 K.	C. B., aurora.	
N.W.	N.W.	W.	2	1	1	4 C.+K.S.	7 K.	5 K.S.	C. B., ptarmigan seen.	
S.	S.	S.	1	2	2	8 K.	7 K.S.+C.	8 K.S.	C. B.	
N.W.	N.W.					8 K.	1 K.		B.	
N.W.	W.	W.	1	1	1	8 K.	7 K.	8 K.S.	C. B.	
W.	N.					7 K.	6 K.	8 K.N.	C. B., snow.	
N.	N.					8 N.	7 K.S.	6 K.S.	C. B. R.	
S.W.	S.W.	S.W.	1	2	2	10 K.S.	8 N.	6 K.	Snow, C. B.	
W.	N.W.	W.	1	2	2	10 K.	8 N.	2 K.	O. dull.	
W.	N.W.	W.	1	2	2	3 K.	3 K.	K.	B.	
W.	N.W.					2 K.	1 K.	1 K.	B.	
W.	W.					2 K.	2 K.	1 K.	B., aurora.	
N.W.	W.	W.	1	1	1	5 N.	6 N.	3 N.	B. C., mist.	
	N.W.					4 K.S.	4 K.	5 K.	B. C.	
S.E.	S.E.					7 K.+C.	4 K.+C.	8 K.	C. B., rain, ptarmigan seen.	
N.E.	S.W.	W.	1	2	2	6 K.	4 N.	3 K.	C. B.	
W.	W.	W.	3	2	2	6 K.	6 K.	1 K.	B. C.	
S.W.	N.	N.	1	1	1	10 K.	10 N.	10 K.	C. B., snow.	
W.	W.	N.W.	1	1	1	3 K.	2 K.		B. B.	
N.W.	N.W.					8 K.	7 K.		C. E.	

METEOROLOGICAL OBSERVATIONS in the

Place.	Date.	Thermometer.			Minimum.	Barometer.		
		1893	7	2	9	7	2	9
Northwest River, Labrador.....	Nov. 21	25	26	20		29.45	29.42	29.60
"	" 22	10	25	15		30.10	30.20	30.18
"	" 23	20	26	24		29.80	29.65	29.55
"	" 24	22	25	28		29.62	29.62	29.42
"	" 25	27	27	24		28.82	28.82	29.32
"	" 26	20	21	21		29.62	29.62	29.80
"	" 27	16	24	13		30.08	30.10	30.22
"	" 28	2	11	12		30.33	30.33	30.20
"	" 29	30	30	33		29.32	29.35	29.24
"	" 30	19	22	20		29.52	29.50	29.42
"	Dec. 1	15	22	5		29.42	29.40	29.75
"	" 2	12	11	0		29.84	29.64	29.52
"	" 3	10	12	-13		30.00	30.12	30.25
"	" 4	2	5	-1		30.04	29.90	29.85
"	" 5	-18	-4	-10		30.40	30.46	30.52
"	" 6	-14	-2	2		30.18	30.00	29.62
"	" 7	5	11	5		29.82	29.92	29.90
"	" 8	7	3	-8		30.00	30.08	30.20
"	" 9	-15	-6	13		30.15	30.05	30.00
"	" 10	-15	-12	-12		30.00	29.96	29.82
"	" 11	5	3	7		29.55	29.45	29.35
"	" 12	15	19	15		29.72	29.80	29.82
"	" 13	-25	-10	-25		29.95	29.94	29.93
"	" 14	-25	-16	-17		29.84	29.82	29.86
"	" 15	-10	-9	-8		29.82	29.83	30.02
"	" 16	-6	-2	-2		30.26	29.25	30.15
"	" 17	10	26	25		29.30	29.32	29.45
"	" 18	21	18	8		29.52	29.45	29.42
"	" 19	0	0	12		29.82	30.00	30.00
"	" 20	-4	0	8		29.64	29.50	29.41
"	" 21	-6	-3	-5		29.35	29.30	29.29
"	" 22	-4	-1	-3		29.50	29.75	29.84
"	" 23	-15	-8	-15		30.00	30.00	30.02
"	" 24	20	-13	-30		30.00	30.02	30.07
"	" 25	-13	-6	-12		29.96	29.90	29.80
"	" 26	-7	-3	10		29.72	29.71	29.70
"	" 27	-10	-3	8		29.60	29.55	29.52
"	" 28	10	18	18		29.42	29.31	29.22
"	" 29	28	30	15		29.2	29.31	29.52
"	" 30	10	-7	17		29.4	30.00	30.23
"	" 31	-25	-10	-15		30.46	30.40	30.30
1894.								
"	Jan. 1	20	-15	-20		30.20	30.05	30.00
"	" 2	-20	-18	-22		30.90	29.92	29.95
"	" 3	-25	-18	-20		30.12	30.15	30.20
"	" 4	-10	-9	-8		29.90	29.75	29.62
"	" 5	0	2	-15		29.50	29.60	29.70
"	" 6	-15	-18	-20		29.90	29.80	29.90
"	" 7	-30	-22	-25		29.90	29.78	29.91
"	" 8	-35	-18	-26		29.90	29.82	29.82
"	" 9	-30	-10	-18		29.82	29.82	29.84
"	" 10	-24	-15	-20		29.90	30.00	30.02
"	" 11	-25	-17	-35		30.10	30.09	30.04

Labrador Peninsula, 1893-1894—Continued.

Wind.						Clouds.			Notes on weather during last 24 hours.
Direction.			Force.						
7	2	9	7	2	9	7	2	9	
N.	N.W.	W.	1	2	1	8 K	8 N	4 K	C. B., rain which soon turns to snow
W.	W.	W.	1	1	1	1 K	3 K	3 K	B.
N.W.	N.W.	W.	1	1	1	6 K	8 K	10 N	C. B., snow.
W.	N.W.	W.	1	1	2	1 K	8 K	10 K	C. B.
N.W.	N.W.	W.	2	2	2	10 N	10 N	7 K	Snow, one foot of snow on ground.
W.	W.	W.	1	2	1	6 K	7 K	8 K	C. B.
N.W.	W.	W.	1	1	1	5 K	8 K	2 K	C. B., Goose Bay frozen.
S.W.	S.W.	W.	1	1	1	2 K	8 K	10 N	C. B., snow.
N.W.	N.W.	W.	1	1	1	8 N	10 N	8 K	C. B., rain.
S.W.	S.W.	W.	1	1	1	1 K	6 K	8 K	B. C. C., ice floating in river.
N.W.	N.W.	N.	1	1	2	2 K	10 N	10 N	B., snow at noon.
W.	N.W.	N.W.	2	1	3	8 K	9 N	6 K	Snow and squalls.
W.	W.	W.	2	2	2	2 K	2 K	2 K	B., clear and calm.
S.W.	N.W.	W.	1	1	2	6 N	2 K	2 K	Snow in morning.
N.W.	N.W.	W.	2	2	1	3 K	2 K	1 K	C. B., aurora.
S.W.	W.	W.	1	1	1	4 K	8 K	10 N	C. B., snow, trout and smelt caught
S.W.	S.W.	W.	1	1	1	5 K	4 K	4 K	C. B., aurora, river frozen over.
W.	W.	W.	1	2	4	4 K	2 K	2 K	B. C., aurora.
S.W.	S.W.	W.	3	1	1	4 K	10 N	10 N	C. B., snow at noon, aurora.
S.W.	S.W.	W.	1	1	1	7 K	7 K	1 K	C. B., river open.
N.W.	S.W.	S.W.	1	1	1	6 K	8 K	8 N	C. B., snow at night.
N.W.	W.	W.	1	1	3	10 N	3 K	3 K	Snow, C. B.
N.	N.W.	N.W.	2	1	3	10 S	6 K	4 S	C. B.
N.	W.	W.	2	3	1	5 K	4 K	3 K	C. B., river half open and ice floating
W.	W.	W.	2	2	2	4 S	6 K	4 S	C. B., much drifting.
W.	W.	W.	2	1	1	4 K	3 K	6 K	C. B.
	N.E.	N.E.	2	2	2	6 K	8 N	8 N	Snow.
S.W.	S.W.	W.	1	1	2	8 K	6 K	6 K	C. B.
S.W.	S.W.	W.	2	1	1	9 K	9 K	9 K	C. B., river open at rapid.
N.W.	N.W.	W.	2	2	2	8 N	8 N	8 N	Snow.
W.	W.	W.	1	1	1	7 K	4 K	2 K	C. B., river frozen.
W.	W.	N.W.	2	2	1	6 K	3 K	2 K	C. B.
W.	W.	W.	2	2	2	2 K	1 K	1 K	B.
N.W.	S.W.	W.	1	1	1	4 K	2 S	2 S	B.
W.	W.	W.	1	1	1	2 K	3 K	3 K	B.
W.	W.	W.	2	1	1	1 K	1 K	1 K	B., aurora.
S.	S.	S.	2	1	2	2 K	4 S	1 K	B., aurora.
S.W.	S.W.	S.W.	1	1	1	8 N	8 N	9 N	C. B., snow, river open.
W.	N.W.	W.	1	1	2	8 N	6 S	6 S	Drifting, aurora.
S.W.	S.W.	W.	1	1	2	3 K	5 K	5 K	C. B.
									C. B.
S.W.	S.W.	W.	2	1	2	7 N	4 N	4 N	B., at 9 p.m. aurora.
W.	W.	W.	2	3	2	3 K	3 K	3 K	B., brilliant aurora.
N.W.	W.	W.	2	1	1	2 K	1 K	1 K	B., brilliant aurora.
N.W.	N.W.	N.W.	1	1	1	6 K	7 N	8 N	Snow.
N.W.	N.W.	N.W.	1	1	2	7 N	6 N	5 K	C. B., snow.
W.	W.	W.	2	3	2	2 K	2 K	2 K	B.
W.	S.W.	S.W.	1	2	1	2 K	2 K	2 K	C. B.
W.	W.	W.	1	1	1	1 K	1 K	1 K	B.
W.	W.	W.	1	1	1	6 K	1 K	1 K	B.
W.	W.	W.	3	2	3	3 K	3 K	3 K	B.
W.	W.	W.	1	1	1	1 K	1 K	1 K	B., brilliant aurora.

METEOROLOGICAL OBSERVATIONS in the

Place.	Date.	Thermometer.			Minimum.	Barometer.		
		7	2	9		7	2	9
	1894.							
Northwest River, Labrador.	Jan. 12	-20	0	-10		29.70	29.70	29.70
"	" 13	-10	16	10		29.65	29.55	29.60
"	" 14	18	20	10		29.82	29.82	29.95
"	" 15	-10	10	0		29.80	29.85	29.90
"	" 16	-2	2	-15		29.99	30.05	30.35
"	" 17	-23	-3	-10		30.62	30.60	30.60
Traverspin	" 18	-10	17	30		30.30		30.50
"	" 19	30	11	0		30.50		30.48
Muskrat Falls	" 20	0	8	-3		30.72		30.82
"	" 21	0	20	10		30.61		30.20
"	" 22	30	33	10		29.90	29.70	29.64
Gull Lake	" 23	0	-2	-5		30.20	30.20	30.20
"	" 24	0	5	0		30.25	30.30	30.50
"	" 25	9	13	-3		30.49	30.49	30.47
"	" 26	-20	-12	-22		30.45	30.45	30.45
Muskrat Falls	" 27	-20	-5	-25		30.42	30.40	30.40
"	" 28	-32	0	18		30.44	30.52	30.58
"	" 29	20	-3	-10		30.70	30.56	30.70
"	" 30	-8	0	-3		30.70	30.70	30.60
Northwest River	" 31	2	5	0		30.60	30.50	30.48
"	Feb. 1	0	-2	-10		30.30	30.25	30.20
"	" 2	-20	-12	-20		30.10	30.12	30.11
"	" 3	-10	0	-6		30.05	29.98	29.80
"	" 4	-12	0	-10		29.75	29.80	29.86
"	" 5	-20	-8	-23		30.20	30.18	30.15
"	" 6	8	12	10		30.00	29.96	29.92
"	" 7	20	22	-8		29.85	29.92	30.00
"	" 8	-10	0	-12		30.50	30.51	30.52
"	" 9	-8	4	-10		30.50	30.45	30.50
"	" 10	-10	3	-10		30.56	30.50	30.30
"	" 11	0	10	-10		30.10	30.08	30.09
"	" 12	-30	-24	-24		30.20	30.10	30.42
"	" 13	-30	-17	-20		30.40	30.30	30.30
"	" 14	-17	0	-3		30.22	30.08	30.10
"	" 15	-5	13	-5		30.05	30.62	29.99
"	" 16	0	5	-5		29.42	29.60	29.72
"	" 17	26	-15	-19		30.22	30.35	30.50
"	" 18	-16	-3	0		30.15	29.95	29.62
"	" 19	0	8	-8		29.95	30.15	30.35
"	" 20	-7	0	-5		30.20	29.85	29.65
"	" 21	-12	-5	-13		29.96	30.07	30.15
"	" 22	-9	-7	-2		30.20	30.17	30.10
"	" 23	-8	8	0		30.08	29.92	29.92
"	" 24	-24	-10	-26		30.00	30.08	30.08
"	" 25	-30	-8	-12		30.22	30.19	30.20
"	" 26	-29	8	-5		30.10	30.02	30.10
Rabbit Island	" 27	-20	0	-6		30.46	30.50	30.52
Traverspin	" 28	-13	0	0		30.32	30.20	30.10
"	Mar. 1	-5	5	10		30.32	30.20	30.12
Muskrat Falls	" 2	32	50	25		30.02	30.21	30.36
"	" 3	21	29	5		30.36	30.31	30.42
"	" 4	5	35	30		30.22	30.20	30.12
"	" 5	32	30	25		29.95	30.00	30.25
"	" 6	20	35	30		30.40	30.20	30.10

Labrador Peninsula, 1893-1894—Continued.

Wind.						Clouds.			Notes on weather during last 24 hours.
Direction.			Force.						
7	2	9	7	2	9	7	2	9	
W.	W.	W.	1	1		7 K.	10 K.	N.	C. B.
N.W.	N.W.	N.W.	1	1		8 N.	10 N.	4 K.	Snow.
N.W.	N.W.	N.W.	1	1		8 N.	6 K. S.		C. B.
W.	W.	N.W.	1	2		2 K. S.	4 K. S.	6 K.	C. B.
N.W.	W.	W.	3	2		1 K.	8 K.	6 K. S.	C. B., heavy drift
W.	W.	W.	1	1		6 K.	2 K.		B.
W.	S.W.	S.W.	1	1		1 K.	9 K. S.	10 S.	Soft, mild.
S.W.	W.	N.W.	1	3		8 S. + C.	9 S.		Drift.
W.	N.		2	1				6 K.	B.
W.	S.W.	W.	3	1		7 K. N.	8 K.	8 S.	C. B.
W.	N.W.	S.W.	3	2		8 K. S.	8 K. S.	7 K. S.	B. C.
S.W.	W.	S.E.	2	2		6 K.		7 S.	B.
W.	W.	N.W.	1	2		10 N.	10 K. S.	10 N.	B., snow at night.
N.W.	N.W.	N.	3	2		3 K.			Snow.
W.	W.	N.W.	2	1		8 S.	5 K.	6 K. S.	B., aurora.
N.W.	W.	N.W.	1	1		6 S.	3 K. S.	6 K. S.	C. B.
W.	N.W.	W.	2	2				2 K.	B., aurora.
W.	E.	N.	2	1		5 K. S.	9 S. K.	4 K.	B.
S.E.	S.W.	S.W.	2	1		6 S.	8 S. K.		C. B.
S.W.	S.W.		2	1		6 K. S.	3 K. S.		C. B., aurora.
S.W.			1						B., brilliant aurora.
S.W.	S.W.	S.W.	2	1		3 K. S.	7 S.	7 K. S.	C. B.
N.W.	N.W.	W.	2	2		8 K. N.	8 K. S. N.	9 K.	Snow drift all day.
W.	W.	W.	2	1		2 K.	2 K.		B., aurora.
W.	W.	W.	1	2		2 K.		8 S.	C. B.
S.W.	S.	S.W.	2	2		8 K.	10 K. C.	K.	Dull.
W.	W.	W.	2	1		3 S.	3 C.		C. B.
W.	W.	W.	1	1		4 S. K.	3 S.	2 K.	B.
W.	W.	W.	1	1		3 K.	1 K.		B.
N.	N.	N.W.	1	2		6 K.	4 K. S.		C. B.
N.W.	N.W.	N.W.	5	3		3 K.			B.
N.W.	W.	W.	2	2		1 K. S.	7 K. S.		C. B.
S.W.	S.W.	S.W.	2	3		2 K. S.	6 K.		B.
W.	W.	W.	2	1		8 N.	6 K.	6 K.	C. B.
N.E.	N.E.	N.E.	2	1		2 K.			B.
N.W.	N.	N.W.	2	1		10 N.	10 N.	10 N.	Snow.
N.W.	N.E.	N.E.	1	1		6 K. S.	4 K. S.		C. B., drift.
N.W.	N.W.	W.	3	2		10 N.	10 N.	10 N.	Snow.
N.W.	N.W.	N.W.	2	1		10 N.	10 N.		B. R., drift, at night aurora.
N.W.	W.	W.	3	2		2 K.	1 K.	3 S.	B. Dull.
W.	S.W.	S.W.	2	3		2 K.	2 K.	3 S.	B.
W.	N.E.	N.E.	1	1		3 K.	6 K. S.	10 N.	B. C., aurora.
N.	N.	N.W.	2	2		6 K.	4 K.		B. C., drift.
N.W.	N.	W.	2	1		3 K.			C. B., aurora.
S.W.	S.W.	W.	1	1		3 K.	7 K.		C. B.
W.	W.	W.	1	1				4 K. S.	C. B.
W.	S.	S.	2	2		6 K. S.	10 N.	8 K. S.	Drift and snow.
S.	S.W.	S.	2	2		2 K.	3 K.	10 K.	C. B.
S.	S.	S.	2	2		7 K. S.	6 K. S.	2 K.	C. B.
W.	W.	W.	2	2		2 K.	1 K.		B.
S.	S.W.	S.W.	1	1		7 K. S.	6 K. + C.	5 S.	C. B.
S.	S.	E.	2	2		10 N.	6 S.		Rain in a.m., C. B.
W.	E.	E.	2	2		2 K.	9 K. + C.	10 K.	O., rain and snow.

METEOROLOGICAL OBSERVATIONS in the

Place.	Date.	Thermometer.			Minib.	Barometer.		
		7	2	9		7	2	9
	1894.							
	Mar. 7	25	28	20		29.76	29.76	29.70
	" 8	10	20	5		30.20	30.20	30.22
	" 9	0	10	0		30.30	30.30	30.40
	" 10	-3	15	25		30.45	30.20	30.12
	" 11	29	40	40		30.02	29.90	29.62
	" 12	35	31	31		29.32	29.52	29.82
	" 13	1		0		29.82		29.92
	" 14	-12		4		30.05		29.85
	" 15	-5		0		29.92		29.82
	" 16	10		0		29.80		29.82
	" 17	12	20	20		29.92	30.05	30.15
Minipi River.	" 18	0	20	5		30.22	30.42	30.39
	" 19	-10		15		30.25		29.94
	" 20	17	25	12		30.08	30.16	30.25
	" 21	-1	10	-5		30.35	30.30	30.05
	" 22	-18	5	2		30.04	29.50	29.54
	" 23	-15	9	-3		29.74	29.68	29.58
	" 24	-5	28	10		29.55	29.44	29.52
	" 25	-9	30	12		29.66	29.47	29.34
	" 26	5	15	10		29.34	29.20	28.84
	" 27	15	12	10		28.44	28.57	28.70
Winokapun Lake.	" 28	-5	10	2		29.02	29.05	29.18
"	" 29	-8	25	25		29.25	29.08	28.92
"	" 30	10	28	0		28.90	28.90	28.85
"	" 31	-12	11	3		29.05	29.06	29.09
"	April 1	10	23	20		28.70	28.36	28.36
"	" 2	-3	15	8		28.60	28.54	28.72
"	" 3	0	12	0		29.00	29.02	29.18
"	" 4	-8	30	0		29.46	29.36	29.42
"	" 5	0	30	22		29.42	29.32	29.42
"	" 6	14	30	20		29.45	29.42	29.40
"	" 7	8	30	30		29.60	29.62	29.65
"	" 8	10	33	21		29.85	29.82	29.95
"	" 9	5	33	21		29.95	29.45	29.92
"	" 10	5	40	33		29.92	29.80	29.84
"	" 11	15	52	38		29.76	29.74	29.76
"	" 12	18	58	38		29.92	29.86	29.85
"	" 13	12	52	45		29.82	29.62	29.62
"	" 14	20	54	48		29.60	29.50	29.52
"	" 15	25	52	42		29.58	29.62	29.48
"	" 16	25	53	45		29.56	29.50	29.56
Hamilton River, below Grand Falls.	" 17	27	34	37		29.83	29.77	29.72
"	" 18	33	45	38		29.51	29.30	29.26
"	" 19	36	39	35		29.30	29.45	29.45
"	" 20	30	40	38		29.56	29.48	29.40
"	" 21	33	38	25		29.26	29.16	29.45
"	" 22	20	41	40		29.62	29.66	29.61
"	" 23	25	45	42		29.56	29.22	29.14
"	" 24	31	31	26		29.35	29.45	29.54
"	" 25	15	42	38		29.50	29.24	29.22
"	" 26	26	47	39		29.22	29.23	29.10
"	" 27	23	42	36		29.35	29.26	29.42
"	" 28	14	26	18		29.60	29.62	29.78
"	" 29	10	27	25		29.86	29.92	29.94

Labrador Peninsula, 1893-1894—Continued.

Wind.			Force.			Clouds.	Notes on weather during last 24 hours.		
Direction.			Force.						
7	2	9	7	2	9	7	2	9	
	E.	W.		2	2	10 C.	10 N.	8 K.	Snow and rain.
W.	W.	W.	2	2	1	1 K.	6 K. + C.	4 K. S.	C. B.
W.	W.	W.	1	1	1		6 K. + C.		B.
W.	W.	W.	2	2	3	4 K.	2 K.	2 K.	B.
S. W.	S.	S.	2	1	1	6 K.	7 S. + C.	6 S. + C.	C. B.
S.	W.	W.	2	2	2	10 S. K.			B. C.
S.	W.	W.	1	2			3 K.		B. B.
W.		W.	1	2				6 K.	B.
						7 K. S.		8 K. S.	C. B.
S.		S.	1	1	1	10 K. S.		7 K. S.	O. G.
			1	1		6 K.	7 K. S.	4 K. S.	O. D.
W.	W.	W.	1	1	1				B. B. B., aurora.
W.	S.	W.	3	2	1	8 K. S.		8 N.	C. B., snow.
W.	S. W.	W.	1	1	2	7 K. S.	4 K.		C. C. B.
N. W.	N. W.	W.	3	2	1				B. B., aurora.
	N. W.		5			3 K.			B. B., aurora.
	W.		1				2 C.	2 K.	B., haze.
		N.		1		2 K. S.	8 K. + C.	6 K.	C. B.
W.	W.		2			3 K.	Mist.		C. B., haze.
W.	S.	S.	1	1	2		8 N.	10 N.	Snow and rain.
N.	N.	N.	3	3	3	7 N.	7 N.	4 N.	Drift and snow.
N.	N.	N.	3	3	3	4 K. S.	6 K.		B. Dull.
W.	W.	S. W.	1	2	1		5 K. + C.	2 K.	B. C.
W.	W.	W.	2	3	4	3 C.	4 S. + C.	5 S. + C.	C. drift.
N. W.	N. W.		4	4	4	3 K.	4 K.		B., brilliant aurora.
E.	E.	E.	2	3	2	10 N.	10 N.	10 N.	Snow and rain.
N. W.	N. W.	N. W.	2	5	5	4 K.	7 K. + C.	10 haze.	C. B.
N. W.	N. W.	N. W.	3	3	3		4 K.		Drift and haze.
N. W.			3	2		4 K. + C.	3 K.	4 K. S.	B.
E.	E.	S.	1	2	2	5 K.	9 K. + C.	8 S. K.	O. Dull.
S.	E.		2	2		10 K. S. + C.	3 S.		C. B., aurora.
E.			1	2			4 S. K.	6 S. K.	B. B.
	S. E.		1	2		7 K. S.	4 K.		B., aurora.
W.	W.	W.	1	1	1				B. B. B.
W.	W.	W.	1	2		1 K.	7 K.		B. B.
W.		S.	1	2		1 K.	4 K. + C.		B. B.
						1 K.			B. B.
	W.	E.	1	1			3 C. + K.	3 C.	Aurora, B. B.
			2			4 K.	4 K. + C.	8 K. + C.	B. C., haze at night.
	S.		2			4 S.		2 S.	B. B.
N. E.	E.		2	2		7 K. S.	4 K. S.	2 K.	C. B.
E.	S. E.		2	2		10 K.	10 K.	6 K. S.	O. Dull.
N. W.	N. W.		2	1		5 K. S.	6 K. S.	4 K. S.	C. B.
	E.	E.	2	1		9 K. S.	9 K. S.	10 K. S.	O. Dull.
	N. W.	N. W.	2	3		10 N.	10 N.	4 K. S.	Snow and rain, at night clouds.
N. W.			2			6 K.	3 K.		B. C.
	S. E.		1			1 K.	10 N.	10 N.	Rain.
	S. E.		2			8 N.	8 K. S.	10 K. S.	C. B.
N. W.	S. W.	S. W.	3	2	1	3 K. + C.	4 C.	6 C.	C. B.
E.	E.	S.	2	1	1	8 K.	8 K. + C.	10 N.	C. B., rain.
N. W.	W.	S. W.	3	2	2	6 K. + C.	1 K.	10 K.	C. B. O.
N. W.	N. W.	N. W.	2	2	2		7 K. S.	10 N.	Snow, bald eagle seen.
N. W.	N. W.	W.	2	2	1	6 K. S.	3 K.	2 K.	B. C.

METEOROLOGICAL OBSERVATIONS in the

Place.	Date.	Thermometer.			Minimum.	Barometer.		
		7	2	9		7	2	9
	1894.							
Hamilton River, below Grand Falls...	April 30....	3	49	42	.....	29.95	29.60	29.55
On tableland	May 1....	36	66	54	.....	29.46	28.71	28.68
Grand Falls	" 2....	37	41	32	.....	28.58	28.42	28.55
"	" 3....	21	33	29	.....	28.76	28.82	28.82
"	" 4....	24	34	33	.....	28.76	28.53	28.46
"	" 5....	32	34	28	.....	28.52	28.45	28.72
"	" 6....	18	42	38	.....	28.72	28.70	28.55
Big Hill, Portage route	" 7....	31	37	32	.....	28.46	28.22	28.01
"	" 8....	30	34	31	.....	27.87	27.95	28.03
"	" 9....	30	36	29	.....	28.18	28.18	28.31
"	" 10....	30	38	25	.....	28.48	28.50	28.95
"	" 11....	22	48	41	.....	28.87	28.52	28.52
"	" 12....	32	62	50	.....	28.58	28.46	28.40
"	" 13....	48	32	30	.....	28.25	28.36	28.46
"	" 14....	28	30	29	.....	28.46	28.48	28.46
"	" 15....	30	37	32	.....	28.48	28.46	28.40
"	" 16....	35	37	35	.....	28.32	28.32	28.30
"	" 17....	36	52	46	.....	28.26	28.33	28.42
"	" 18....	30	58	44	.....	28.44	28.60	28.66
Grand Falls, Spring Camp	" 19....	39	49	46	.....	28.74	28.83	28.92
"	" 20....	42	54	48	.....	28.06	29.00	28.95
"	" 21....	46	44	36	.....	28.93	28.92	28.86
"	" 22....	35	44	35	.....	28.88	28.82	28.63
"	" 23....	38	60	39	.....	28.59	28.51	28.48
"	" 24....	35	58	40	.....	28.50	28.48	28.52
"	" 25....	30	60	48	.....	28.48	28.52	28.50
"	" 26....	30	65	45	.....	28.52	28.50	28.54
"	" 27....	44	54	43	.....	28.50	28.54	28.54
"	" 28....	44	60	45	.....	28.52	28.48	28.46
"	" 29....	38	54	44	.....	28.50	28.45	28.56
"	" 30....	38	57	48	.....	28.60	28.47	28.46
"	" 31....	40	58	48	.....	28.44	28.48	28.49
Hamilton River, above Grand Falls...	June 1....	37	59	48	.....	28.50	28.40	28.36
"	" 2....	48	56	52	.....	28.30	28.13	28.13
"	" 3....	49	65	48	.....	28.08	28.04	27.94
"	" 4....	45	65	47	.....	27.88	27.83	27.83
"	" 5....	46	40	35	.....	27.76	27.92	27.65
"	" 6....	37	45	37	.....	28.10	28.14	28.24
"	" 7....	45	40	40	.....	28.24	28.23	28.21
"	" 8....	31	54	46	.....	28.24	28.10	28.04
"	" 9....	50	52	38	.....	28.05	28.12	28.22
"	" 10....	37	42	36	.....	28.30	28.29	28.35
"	" 11....	35	42	34	.....	28.35	28.50	28.52
"	" 12....	37	46	37	.....	28.60	28.56	28.56
"	" 13....	37	.....	.....	.....	28.63	28.62	28.51
Sandy Lake	" 14....	58	.....	50	.....	28.42	28.50	28.32
"	" 15....	44	59	50	.....	28.30	28.24	28.02
"	" 16....	44	58	48	.....	28.02	28.06	28.06
"	" 17....	52	60	44	.....	28.02	28.26	28.35
"	" 18....	42	.....	.....	.....	28.46	28.34	28.26

Labrador Peninsula, 1893-1894.—Continued.

Wind.					Clouds.			Notes on weather during last 24 hours.
Direction.			Force.					
7	2	0	7	2	0	7	2		0
S.E.	S.E.	E.	2	1	1 K.	8 K. S.	6 K. S.	C. B., O. dull.
			1		10 K + C.	4 K.	1 K.	O. dull, B., thunder, black ducks seen.
					7 K. S.	10 N.	10 N.	Rain and snow, a butterfly and several moths seen.
N.W.	W.		2	2	10 K. S.	4 K. S.	1 K.	C. B. B., rose-breasted grosbeak seen.
S.	S.	S.W.	2	1	10 K. S.	10 N.	10 S.	Snow and rain, Canada goose seen.
					9 S. K.	6 K. S.	1 S.	Showers, C. B.
						1 S.	3 S + C.	C. B., haze.
S.	S.E.	S.E.	2	2	10 N.	10 N.	10 N.	Rain and snow.
S.E.	S.E.	S.E.	1	2	10 N.	10 S + N.	10 N.	Snow and rain.
S.E.	E.	N.	2	2	10 N.	10 N.	10 N.	Snow.
W.	W.		2	1	8 K. S.	2 K.	2 K.	C. B. B.
S.E.	S.E.	S.	2	2	10 K. S.	10 S.	10 S + C.	C. B., showers.
S.W.	S.E.		2	1	7 S. K.	4 K.	10 S.	O. dull, showers; robins seen.
	N.W.	W.	2	2	10 N.	10 N.	10 S.	Snow.
N.W.	N.W.	N.W.	2	3	10 N.	10 N.	10 N.	Snow, a black bear and gray geese seen.
N.W.	N.E.	N.	3	2	10 S.	10 S.	10 N.	O. dull, snow. [seen.]
N.	N.	N.	2	2	10 N.	7 S. N.	10 S.	C. B., snow and rain; rusty grackle
	N.W.		1		10 N.	10 N.	7 K.	Snow and rain.
	E.		1		3 S.	5 K. S.	7 K + C.	C. B., gulls seen.
S.E.	S.E.	E.	1	2	10 K + C.	7 K. S.	8 S.	C. O. dull.
E.	S.E.	S.	2	2	10 S.	7 S.	10 S.	C. B.
S.	W.	W.	1	1	10 N.	8 S.	10 S.	Rain, C. B.
	W.	W.	1	1	7 S.	6 S.	2 K.	C. B.
	W.	N.W.	2	1				B. B. B.
N.W.	W.	W.	1	1	1 K.		1 K.	B. B., mosquitoes in numbers.
	S.		1		2 K.	1 K.	2 K.	R. B., swallows seen.
	S.E.	S.E.	1	1		3 K.	3 S.	B. B.
S.W.	W.	W.	1	1	2 S.	3 K.	2 K.	B. B.
		S.W.			10 K. S.	2 K.	1 K.	C. B.
N.E.	N.E.		1	1	6 K. S.	5 K. S.	4 K. S.	C. B., ice formed last night.
	S.	S.	1	1	3 K. S.	10 K. S.	7 K. S.	C. B., ice formed last night.
S.E.	S.E.		1	2	8 K. S.	6 S.	7 K. S.	C. B.
	S.W.	S.W.	2	1	2 K. S.	5 K. S.	7 K + C.	B. C.
S.W.	S.W.	S.W.	2	1	10 N.	6 S.	7 S.	Rain, C. B.
					9 S.	6 S.	7 K. S.	C. B.
	S.W.		2		1 K.	7 S.	7 S + C.	C. B., ice formed last night; thunder
N.	N.	N.	1	2	10 S.	10 N.	10 N.	C. C., rain and snow.
N.	N.		2	2	10 N.	10 N.	9 S.	C. B., severe snow storm. — [seen.]
S.W.	S.W.	S.W.	1	2	10 N.	7 S.	8 K. S.	Rain, C. B., robin's nest found having fetus well developed and partly feathered.
S.	S.	S.W.	1	2	7 K. S.	3 S.		B., ice formed.
S.	S.	N.	2	2	10 S.	6 K.	4 S.	C. B., Viola canina in bloom.
N.	N.W.	N.W.	3	2	7 S.	5 K. S.	7 K. S.	B. C., snow; partridge nest eggs partly hatched. [hatched.]
N.	N.		3	3	10 K. S.	7 K. S.	8 K + C.	C., snow and hail; young woodpecker
	N.W.		2		10 K + C.	10 S.	2 S.	C. B., Osprey's eggs found.
	N.W.	N.W.	3	1	10 S.	7 S.	4 S.	C. B.
W.	S.W.	S.W.	2	3	6 S + C.	3 S.	8 C + K.	C. B., unbroken ice still in lakes in [some places.]
	N.E.		2		4 K. S.	6 C + K.	8 C + S.	C. B., slight frost last night.
S.	E.	E.	2	2	7 S + C.	10 haze.	10 S + C.	O. dull, showers.
S.W.	S.W.	S.W.	1	2	10 S.	6 K. S.	6 K.	C. B., showers.
S.	S.		2	2	2 S.	2 K. S.	7 C + S.	C. B., thermometer broken.

METEOROLOGICAL OBSERVATIONS in the

Place.	Date.	Thermometer.			Minimum.	Barometer.		
		1804.	7	2	0	7	2	0
	June 19.					29.27	28.30	31.31
	" 20.					29.34	28.32	31.31
	" 21.					29.34	28.32	31.31
Dyke Lake	" 22.					29.37	28.35	31.31
	" 23.					29.45	28.44	31.31
Petitsikapau Lake	" 24.					29.55	28.52	31.35
"	" 25.					30.00	28.52	31.39
"	" 26.					29.57	28.53	31.35
"	" 27.					29.57	28.55	31.36
"	" 28.					29.45	28.52	31.54
"	" 29.					29.42	28.52	31.42
"	" 30.					29.35	28.52	31.35
"	July 1.					29.46	28.45	31.42
"	" 2.					29.35	28.51	31.36
"	" 3.					29.42	28.51	31.05
Ashuanipi Branch	" 4.					29.42	28.51	31.05
"	" 5.					29.57	28.52	31.05
"	" 6.					29.57	28.52	31.05
"	" 7.					29.16	28.16	31.05
"	" 8.					29.26	28.16	31.05
"	" 9.					29.40	28.16	31.05
Highest point reached on Hamilton River on Ashuanipi Branch	" 10.					29.45	28.12	31.05
"	" 11.					29.34	28.12	31.05
"	" 12.					29.02	28.12	31.05
"	" 13.					29.16	28.12	31.05
"	" 14.					29.15	28.11	31.05
"	" 15.					29.08	28.11	31.05
"	" 16.					29.26	28.11	31.05
Sandy Lake	" 17.					29.42	28.34	31.05
"	" 18.					29.34	28.32	31.05
"	" 19.					29.40	28.32	31.05
"	" 20.					29.42	28.32	31.05
Michikaman Lake	" 21.					29.32	28.30	31.05
"	" 22.					29.38	28.32	31.05
"	" 23.					29.40	28.32	31.05
"	" 24.					29.46	28.32	31.05
"	" 25.					29.43	28.32	31.05
"	" 26.					29.24	28.32	31.05
"	" 27.					29.52	28.35	31.05
"	" 28.					29.36	28.32	31.05
"	" 29.					29.13	28.32	31.05
Sandy Lake	" 30.					29.02	28.31	31.05
"	" 31.					29.14	28.31	31.05
"	Aug. 1.					29.05	28.29	31.05
"	" 2.					29.30	28.35	31.05
Osokmanowan Lake	" 3.					29.44	28.42	31.05
"	" 4.					29.18	28.42	31.05
"	" 5.					29.02	28.42	31.05
"	" 6.					29.12	28.41	31.05
Attiomis-konak Lake	" 7.					29.14	28.41	31.05
"	" 8.					29.02	28.41	31.05
"	" 9.					29.21	28.45	31.05
Romaine River	" 10.					29.26	28.45	31.05

Labrador Peninsula, 1893-1894.—Continued.

Wind.						Clouds.			Notes on weather during last 24 hours.
Direction.			Force.						
7	2	9	7	2	9	7	2	9	
S.W.	S.W.	S.W.	2	2	2	6 K.	4 K.	10 K + C.	B. C.
N.W.	N.W.	N.W.	2	2	2	4 C.	7 K.	3 K.	C. B.
						3 K.	4 S.	10 N.	C. B., rain.
S.W.	W.	N.W.	2	2	2	10 S.	10 N.	10 N.	Rain, thunder and lightning.
S.W.	N.W.	N.	3	2	2	10 S.	3 K.	2 K.	O. dull, C. B.
S.W.	N.W.	N.W.	1	1	1	1 K.	3 K.	6 S.	B. B., ice formed last night.
S.W.	N.W.	N.W.	2	2	2	10 K.	10 K.	6 K.	Rain, C. B.
S.W.	N.W.	N.W.	2	2	2	10 K.	10 K.	10 N.	Rain.
S.W.	N.W.	N.W.	2	2	2	10 K.	10 K.	10 N.	Rain, O. dull.
S.W.	N.W.	N.W.	2	2	2	10 K.	10 K.	10 N.	C. B., ice formed, a flurry of snow at [7 a.m.
S.W.	N.W.	N.W.	2	2	2	1 K.	1 K.	2 K.	B., ice formed last night.
E.	S.	S.	3	2	2	10 S.	0 S.	4 K.	O. dull.
E.	S.	S.	1	1	1	10 S.	10 K.	4 K.	C. B.
S.E.	S.	S.	2	2	2	10 S.	10 S.	10 N.	O. dull, rain.
S.	S.	S.	1	1	1	7 K.	7 K.	10 S.	C. B.
S.W.	S.W.	S.W.	1	2	2	10 S.	10 K.	7 S.	C. B., passing showers.
S.W.	S.W.	S.W.	2	2	2	10 S.	10 S.	10 S.	C. B., passing showers.
S.W.	S.W.	S.W.	2	2	2	10 K.	10 S.	8 K.	C. B., passing showers.
S.E.	E.	E.	2	1	1	6 K.	4 S.	8 K.	B.
E.	E.	E.	1	1	1	10 S.	8 K.	10 S.	C. B.
E.	E.	E.	1	1	1	10 S.	10 K.	7 S.	C. B., showers.
						10 S.	8 S.	10 S.	C. B., thunder shower.
S.	S.	S.	1	1	1	10 K.	10 K.	7 S.	C. B., showers.
S.	S.	S.	1	1	1	10 K.	6 S.	8 K.	C. B., showers.
N.W.	N.W.	N.W.	2	2	2	8 K.	7 S.	10 N.	C. B., showers.
N.W.	N.W.	N.W.	2	2	2	10 S.	6 S.	10 N.	C. B., rain.
N.W.	N.W.	N.W.	2	2	2	10 S.	6 S.	7 S.	C. B., rain.
N.W.	N.W.	N.W.	2	2	2	10 S.	6 S.	12 S.	C. B., hail and showers.
N.W.	N.W.	N.W.	2	2	2	10 S.	6 S.	10 S.	C. B.
						10 S.	10 K.	5 S.	B. C., thunder showers.
W.	W.	W.	2	2	2	10 S.	6 S.	8 K.	Fog, C. B.
N.W.	N.W.	N.W.	2	2	2	10 S.	6 K.	8 N.	C. B., showers at intervals during [night.
S.	S.	W.	2	2	2	3 K.	3 K.	7 K.	C. B.
N.W.	N.W.	W.	2	2	2	3 K.	10 K.	10 N.	C. B., rain.
S.W.	N.W.	S.W.	3	3	3	6 K.	3 K.	6 N.	C. B., rain.
S.W.	S.W.	S.W.	3	3	3	7 K.	4 K.	6 K.	C. B., ptarmigan in full summer plu- [mage
S.	S.	S.W.	2	2	2	10 N.	10 N.	10 N.	Steady rain.
N.W.	N.W.	N.W.	2	2	2	7 K.	10 N.	3 K.	Showers.
N.W.	N.W.	N.W.	1	1	1	2 K.	4 K.	3 K.	B., heavy frost last night.
E.	E.	E.	1	1	1	6 K.	10 N.	8 K.	C. B., rain, showers.
E.	E.	E.	3	3	3	7 S.	10 N.	8 N.	C. B., rain.
E.	E.	E.	1	1	1	10 N.	10 S.	10 N.	R. R., heavy showers.
S.W.	S.W.	S.W.	2	2	2	10 N.	10 S.	9 S.	C. C., showers.
S.W.	S.W.	N.W.	2	2	2	10 N.	10 S.	6 K.	C. R. R., heavy rain.
N.W.	N.W.	N.W.	2	2	2	10 N.	9 K.	9 S.	Rain, C.
	S.	N.W.	2	2	2	10 N.	5 S.	10 K.	C. C.
S.W.	S.W.	S.W.	2	2	2	10 K.	10 N.	9 S.	Rain.
N.W.	N.W.	N.W.	2	2	2	10 S.	9 K.	7 S.	C. C., showers.
W.	S.	S.	2	2	2	10 S.	10 K.	10 S.	Mist, much rain, thunder and light- [ning.
N.W.	S.W.	S.W.	2	2	2	1 K.	10 S.	10 S.	C., gales, rain, thunder and lightning.
N.W.	S.W.	S.W.	2	2	2	5 K.	10 S.	10 S.	C., rain.
W.	N.W.	N.W.	2	2	2	10 K.	8 S.	10 S.	C. C.
	N.	N.W.	2	2	2	10 K.	10 K.	7 K.	C. B., ice formed.

METEOROLOGICAL OBSERVATIONS in the

Place.	Date.	Thermometer.			Minimum.	Barometer.		
	1894.	7	2	9		7	2	9
Romaine River.....	Aug. 11.....					28.36	28.34	28.37
"	" 12.....					28.42	28.48	28.44
"	" 13.....					28.42	28.47	28.52
"	" 14.....					28.52	28.55	28.54
"	" 15.....					28.52	28.46	28.42
"	" 16.....					28.36	28.18	28.19
"	" 17.....					28.26	28.25	28.42
"	" 18.....					28.40	27.98	27.78
"	" 19.....					27.78	28.08	28.12
St. John River.....	" 20.....					28.15	28.20	28.04
St. John Village.....	" 21.....					28.94	29.35	29.55
"	" 22.....					29.55	29.62	29.64
Mingan.....	" 23.....					29.84	29.80	29.70
"	" 24.....					29.75	29.86	29.83

Labrador Peninsula, 1893-1894—Continued.

Wind.						Clouds.			Notes on weather during last 24 hours.
Direction.			Force.						
7	2	9	7	2	9	7	2	9	
	N.		2	1	4 S.	2 S.	3 S.	B.	
	N.W.		2	1	1 S.	2 K.	2 K.	B. B.	
			2	2	3 S.	3 K.	7 S.	C. B.	
S.	S.	S.	3	3	10 K. S.	10 K. S.	10 S.	C. B., showers.	
S.			1	1	10 N.	10 N.	10 N.	Rain.	
S.	S.	N.E.	1	1	10 N.	10 N.	10 N.	Steady rain.	
					10 S.	9 S.	2 K.	C. C. to C. B.	
					10 K.	7 S.	3 S.	C. B.	
W.	W.	N.W.	2	1	10 K.	3 K. S.	2 K.	C., rain.	
N.	N.		2	1	10 N.	7 S.	10 S.	C., rain, C.	
	N.	N.	2	1	4 C. + S.	10 N.	10 S.	C. to C. B.	
		N.	2	1	10 S.	5 S.	7 S.	C. B.	
S.	S.E.	W.	1	1	7 S.	5 S.	8 S.	C. B.	
W.	W.	W.	1	2	5 K. S.	8 K. S.	10 N.	C. B., rain.	
			2	2	10 K.	7 K.	2 K.	C. B., showers.	

APPEN

METEOROLOGICAL OBSERVATIONS in the

Place.	Date.	Thermometer.			Minimum.	Barometer.		
		1895.	7	2	0	7	2	0
River St. Lawrence at mouth of Manicouagan River	July 1	53	65	53	43	30.00	29.95	29.95
" " " "	" 2	53	69	64	42	30.00	30.22	29.94
Manicouagan River	" 3	52	80	63	56	29.95	29.96	29.87
" " " "	" 4	60	80	70	59	29.96	29.92	29.74
" " " "	" 5	54	95	72	59	29.79	29.74	29.64
" " " "	" 6	60	75	75	59	29.65	29.62	29.52
" " " "	" 7	65	85	65	64	29.47	29.42	29.31
" " " "	" 8	62	88	67	55	29.42	29.32	29.32
" " " "	" 9	60	85	68	59	29.32	29.32	29.29
" " " "	" 10	52	65	50	46	29.49	29.49	29.49
Manicouagan Lake	" 11	38	80	60	32	29.56	29.52	29.85
Lake Mouchalagan	" 12	50	68	62	40	29.90	29.84	29.65
" " " "	" 13	59	60	60	56	29.64	29.75	29.76
" " " "	" 14	53	71	59	59	29.86	29.86	29.85
" " " "	" 15	53	80	60	43	29.89	29.75	29.70
Upper Manicouagan River	" 16	65	80	58	60	29.71	29.71	29.66
" " " "	" 17	59	74	56	55	29.65	29.51	29.46
" " " "	" 18	55	65	51	59	29.29	29.35	29.44
" " " "	" 19	50	60	48	45	29.61	29.60	29.62
Cache at foot of portage route	" 20	48	60	55	35	29.60	29.55	29.55
" " " "	" 21	60	65	60	59	29.60	29.60	29.55
Portage route	" 22	52	65	50	46	29.54	29.80	29.75
" " " "	" 23	55	65	62	50	29.76	29.50	29.45
" " " "	" 24	60	68	52	50	29.46	29.48	29.48
" " " "	" 25	50	65	50	40	29.39	29.06	29.94
" " " "	" 26	55	67	40	48	29.95	29.92	29.84
" " " "	" 27	40	65	40	33	29.72	29.86	29.86
" " " "	" 28	50	60	48	40	29.84	29.80	29.80
" " " "	" 29	48	58	52	45	29.69	29.70	29.86
" " " "	" 30	48	60	45	32	29.90	29.92	29.94
" " " "	" 31	48	65	52	45	29.92	29.94	29.96
" " " "	Aug. 1	48	65	48	42	29.94	29.97	29.96
" " " "	" 2	48	60	50	45	29.10	29.10	29.16
" " " "	" 3	45	62	51	35	29.21	29.26	29.30
Attikopi Lake	" 4	55	65	60	45	29.36	29.30	29.35
" " " "	" 5	50	65	56	50	29.32	29.32	29.36
Little Attikopi Lake	" 6	45	77	57	40	29.40	29.38	29.46
" " " "	" 7	53	60	57	50	29.46	29.42	29.29
Height of Land, Nicheun River	" 8	57	66	55	56	29.05	29.00	29.98
Nookokan Lake	" 9	55	57	50	52	29.14	29.30	29.42
" " " "	" 10	45	72	42	42	29.46	29.36	29.46
Little Attikopi Lake	" 11	45	65	62	42	29.42	29.42	29.35
" " " "	" 12	52	60	52	52	29.35	29.32	29.11
River above	" 13	52	60	55	52	29.04	29.04	29.11
Watershed Lake	" 14	53	60	52	49	29.14	29.14	29.24
" " " "	" 15	52	60	50	48	29.26	29.28	29.24
Manicouagan River below Watershed Lake	" 16	48	54	40	42	29.30	29.32	29.35
" " " "	" 17	40	65	50	32	29.30	29.29	29.26
" " " "	" 18	54	60	51	52	29.05	29.10	29.10
" " " "	" 19	49	55	38	42	29.08	29.24	29.30

DIX VII.

Labrador Peninsula, 1895.

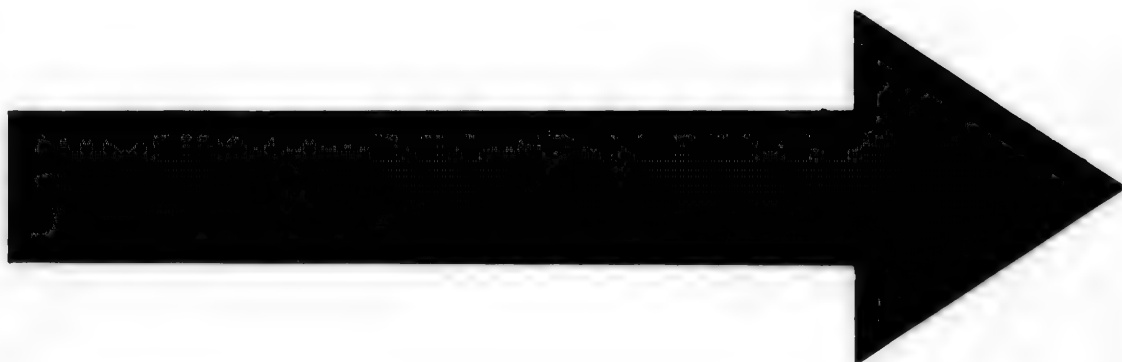
Wind.						Clouds.						Weather.						Remarks.
Direction.			Force.															
7	2	9	7	2	9	7	2	9	7	2	9	7	2	9				
	N.E.			2			6 N			R.	B.				Passing showers.			
	W.	W.	W.	2	2	2 K	3 S.	2 S.	B.	B.	B.							
	W.	W.	W.	1	2	3 K	10 H	3 K	B.	B.	B.							
	W.	W.	S.	1	1	H		4 K	B.	B.	B.							
	S.	S.		2	2	6 H	4 H	3 K	B.	B.	C.B.							
	S.	S.		2	2	4 K	6 K	4 K	B.	B.	B.							
						10 N	4 K	4 K	R.	B.	B.							
N.W.	N.W.	N.W.	3	2	2	10 K	10 N	7 S.	C.B.	R.	C.B.							
W.	W.	W.	1	2	1	6 S.	6 S.	8 K	C.B.	C.B.	C.B.							
W.	W.	W.	1	2	1	1 K	7 K	8 S.	B.	C.B.	C.B.				Rain in passing showers.			
S.	S.E.	S.	1	2	1	10 K	10 N	7 K	C.B.	C.B.	C.B.							
S.	S.E.	S.	1	2	1	6 K	10 K	7 S.	B.	C.B.	C.B.							
S.	S.E.	S.	1	2	1	10 H	3 K	10 S.	C.B.	B.	C.B.							
S.	S.E.	S.	1	1	1	4 S.	2 S.	4 S.	C.B.	B.	C.B.				Showers.			
S.	S.E.	S.	1	2	2	6 K	8 K	10 K	C.B.	C.B.	C.B.				"			
S.	S.E.	S.	1	1	1	10 N	7 S.	10 S.	C.B.	C.B.	C.B.							
S.	S.E.	S.	1	2	1	7 S.	7 K	8 K	C.B.	C.B.	C.B.							
S.	S.E.	S.	1	2	2	10 K	10 S.	10 S.	C.B.	C.B.	C.B.							
S.	S.W.	S.	2	2	2	4 S.	4 S.	5 S.	B.	B.	C.B.							
S.	S.W.	S.W.	2	2	2	3 S.	7 S.	10 N.	B.	C.B.	R.				Thunder; heavy rain.			
S.	S.W.	S.W.	2	2	2	8 S.	10 S.	7 K	C.B.	C.B.	C.B.				Showers and heavy rain.			
S.	S.W.	S.W.	2	2	1	10 K	10 K	7 S.	C.B.	C.B.	R.							
S.	S.	S.	1	2	2	10 K	10 K	8 K	C.B.	C.B.	C.B.							
S.	S.	S.	1	2	2	8 K	8 K	10 K	C.B.	C.B.	C.B.				Passing showers.			
S.	S.W.	S.	2	2	2	10 N	10 N	8 K	R.R.	C.B.	C.B.				Rain.			
S.	N.	N.	2	2	1	10 N	10 N	10 N	R.	R.	R.				Heavy rain.			
S.	E.	E.	2	2	2	10 H	10 N	10 N	C.B.	C.B.	C.B.				Rain.			
S.	E.	E.	2	2	2	10 N	10 N	6 K	S.	R.	R.							
S.	W.	W.	1	2	2	9 H	8 K	7 K	D.H.	C.B.	C.B.				Heavy showers.			
S.	W.	W.	2	2	2	10 K	10 K	5 S.	D.H.	C.B.	R.				Showers passing.			
S.	N.W.	N.W.	1	1	1	7 S.	7 S.	4 S.	R.C.	S.	C.B.				"			
S.	S.E.	S.E.	2	2	2	10 H	8 S.	7 S.	C.B.	R.	C.B.				"			
S.	S.E.	S.E.	2	2	2	10 H	6 S.	7 S.	C.B.	R.	C.B.				"			
S.	S.E.	S.E.	2	2	2	10 H	6 S.	7 K	C.B.	B.	C.B.				"			
S.	N.E.	N.	1	2	2	8 K	10 N	10 N	C.B.	C.B.	R.				"			
S.	S.W.	S.W.	2	2	2	10 N	10 N	10 S.	R.	R.	C.E.				"			
S.	S.W.	S.W.	2	2	2	10 K	10 K	10 K	C.	C.	C.B.				"			
S.	S.	S.	2	2	2	10 K	7 K	10 K	C.	C.	C.B.				"			
S.	S.	S.	2	2	2	7 K	4 K	8 K	C.	C.	C.				"			
S.	S.	S.	2	2	2	10 N	10 N	10 K	R.	C.B.	R.				"			
S.	S.	N.W.	2	2	1	10 N	7 N	8 N	R.	R.	R.				Heavy showers.			
S.	S.	S.	2	2	2	7 S.	7 K	6 K	R.	R.	C.				Heavy showers passing.			
S.	S.	S.	2	2	2				C.	C.	C.B.				Showers.			
S.	S.	S.	2	2	2	10 K	10 K	4 K	C.	C.	C.				"			
S.	S.W.	N.W.	2	2	2	6 K	6 S.	7 S.	F.	R.R.	C.B.				[and lightning			
S.	S.W.	S.W.	1	2	2	10 N	7 K	7 K	R.	R.	C.				Heavy rain; thunder			
S.	S.W.	W.	2	2	3	10 K	7 K	4 S.	C.	C.	C.B.				Showers.			

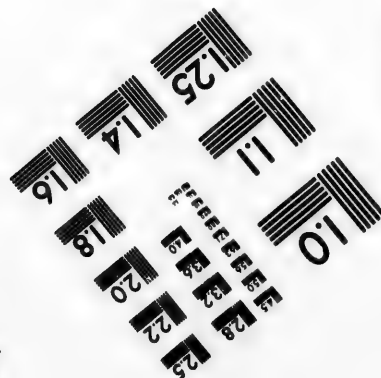
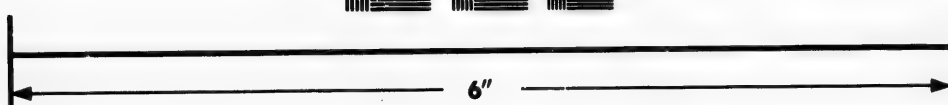
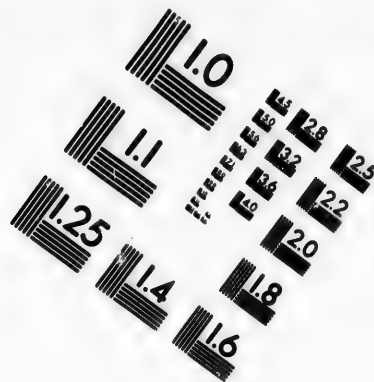
METEOROLOGICAL OBSERVATIONS in the

Place.	Date.	Thermometer.			Minimum.	Barometer.		
		1895.	7	2	9	7	2	9
Manicouagan River below Watershed								
Lake.....	Aug. 20....	40	50	41	32	28.29	28.24	28.25
" " " " " "	" 21....	40	54	43	37	28.34	28.42	28.64
" " " " " "	" 22....	36	51	45	32	28.70	28.83	28.96
" " " " " "	" 23....	50	54	50	.....	28.70	28.65	28.75
" " " " " "	" 24....	50	65	55	.....	28.86	28.94	29.00
Cache at foot of Portage route.	" 25....	45	65	45	.....	28.96	29.24	29.24
" " " " " "	" 26....	40	65	40	35	29.35	29.24	29.62
Mouchalagan Lake.....	" 27....	34	60	48	31	29.68	29.62	29.35
" " " " " "	" 28....	45	55	45	.....	29.15	29.35	29.46
" " " " " "	" 29....	38	62	40	34	29.59	29.72	29.76
" " " " " "	" 30....	40	65	58	35	29.82	30.28	30.42
Aux Outardes River.	" 31....	50	60	50	48	30.28	29.95	29.85
River St. Lawrence at mouth of Aux								
Outardes River.....	Sept. 1....	51	60	52	..	29.95	30.43	30.43
" " " " " "	" 2....	48	.....	.....	.....	30.50	.....	.....

Labrador Peninsula, 1895—Continued.

Wind.			Clouds.						Weather.			Remarks.	
Direction.			Force.										
7	2	9	7	2	9	7	2	9	7	2	9		
W.	W.	W.	2	3	3	3	N	10	N	7	C	R.	Showers.
W.	W.	W.	2	2	2	8	K.S.	10	K.S.	7	C.B.	C.B.	Passing showers.
N.W.	N.W.	N.W.	2	2	2	10	N	10	N	6	C.B.	C.B.	
W.	W.	W.	2	2	2	8	K.S.	10	N	7	C.B.	C	
W.	W.	W.	2	2	2	8	K.S.	10	N	7	C.B.	C.B.	
W.	W.	W.	2	2	2	6	K.S.	10	N	6	C.B.	R.	
S.	S.	S.	2	3	3	10	K	7	K	10	N	F	
S.W.	S.W.	S.W.	2	3	2	10	N	7	K.S.	4	C	R.	
S.W.	S.W.	S.W.	2	3	2	7	C	10	K	1	K	C.B.	
S.	S.	S.	3	3	2	7	K	6	C	4	K.S.	C.B.	
S.	S.W.	S.W.	3	3	1	10	K.S.	6	C	10	N	C.B.	
S.W.	S.W.	S.W.	2	3	2	7	K.S.	6	K.S.	3	K.S.	C.B.	
S.W.	S.W.	S.W.	2	3	2	4	K.S. + C	6	K.S.	3	C.B.	C.B.	





**23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503**

18 20 22 25 28 32 36 40 45 50 55 60 65 70 75 80 85 90 95 100

10 01 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

585

LABRADOR PENINSULA.

South-West Sheet.

Legend

D	Cambro-Silurian
C	Cambrian
B	Huronian
A	Laurentian; including Fundamental Gneisses and Grenville Series, sometimes with limestones

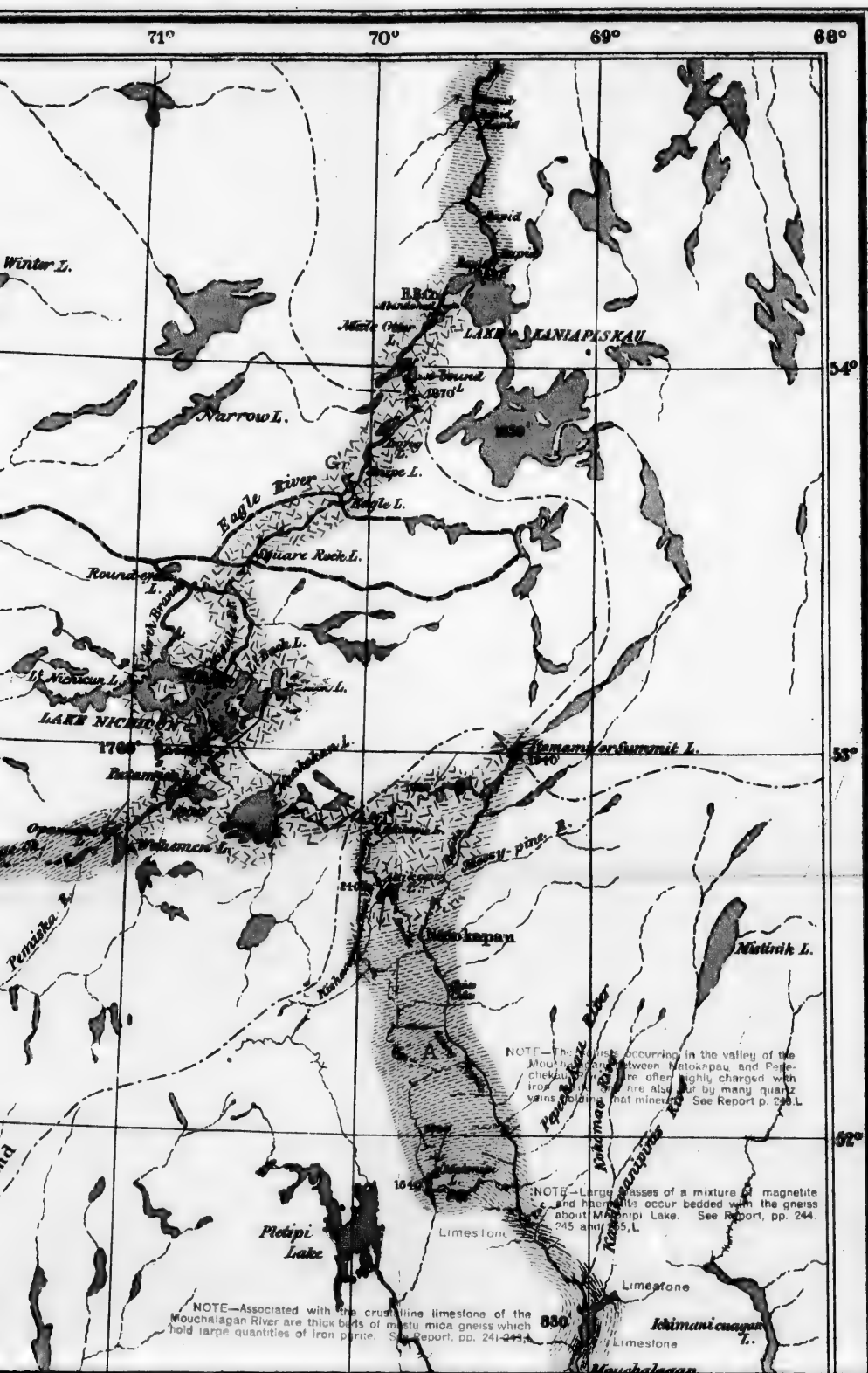




GEORGE M. DAWSON, C.M.G., LL.D., F.R.S. &c., DIRECTOR

1896










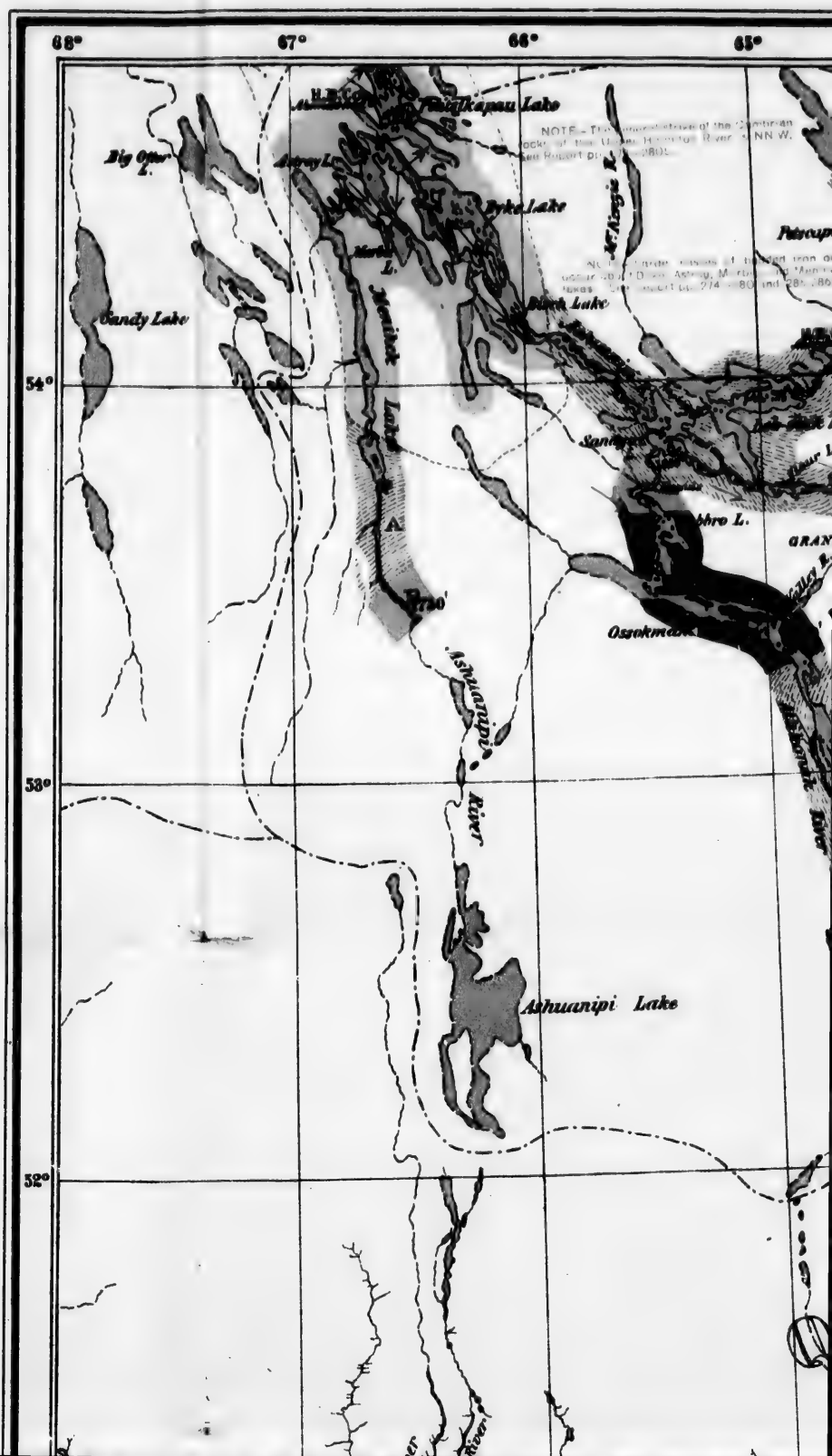
586

LABRADOR PENINSULA.

South-East Sheet.

Legend

	<i>D</i> Cambro-Silurian
	<i>C</i> Cambrian
	<i>B</i> Huronian
	<i>A</i> Laurentian; including Fundamental Gneisses and Grenville Series, sometimes with limestones
	Massive granitic rocks

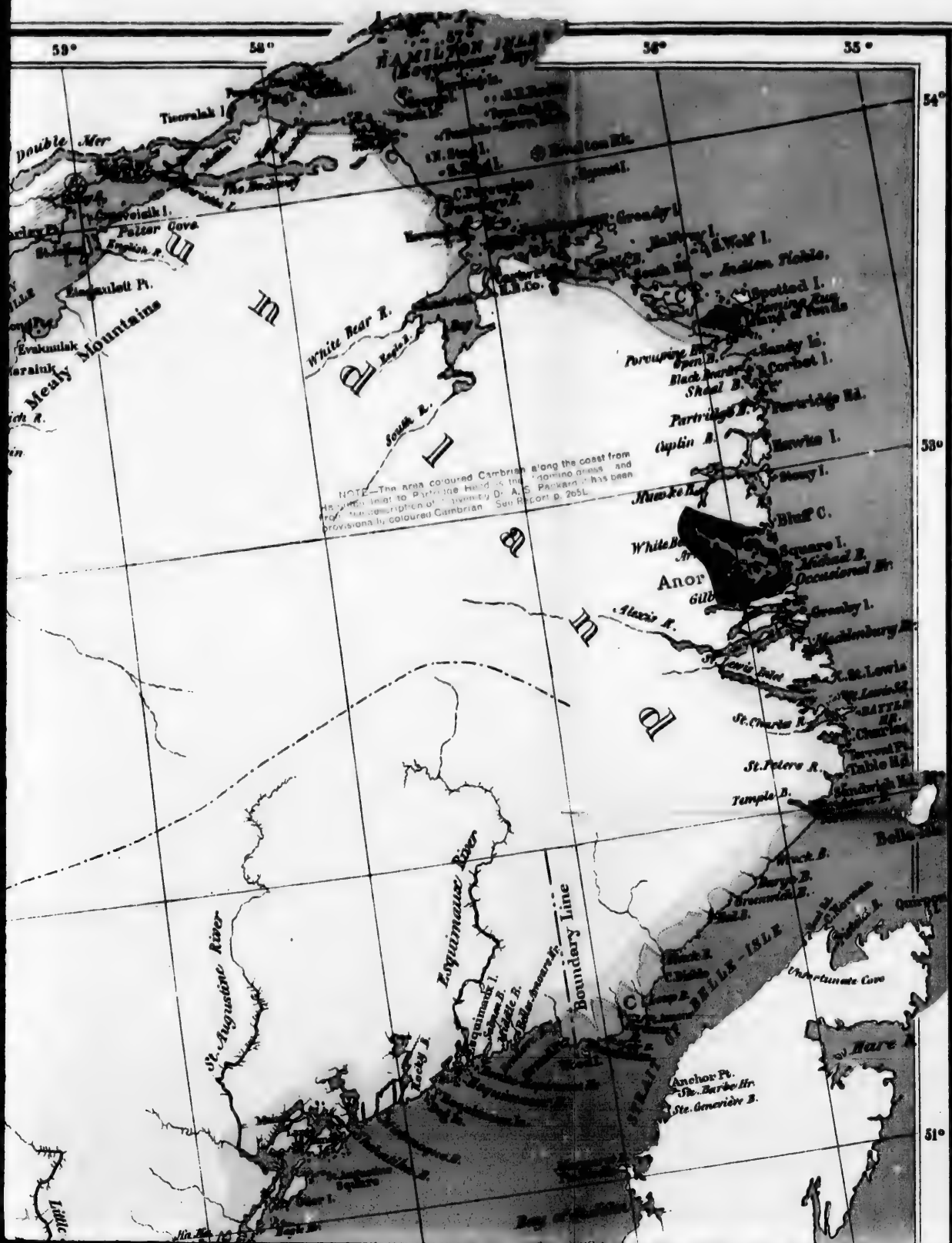


GEORGE M DAWSON, C.M.G., LL.D., F.R.S. &c, DIRECTOR

GEORGE M. DAWSON, C.M.G., LL.D., F.R.S. &c, DIRECTOR

1504







Massive granitic rocks



Anorthosites



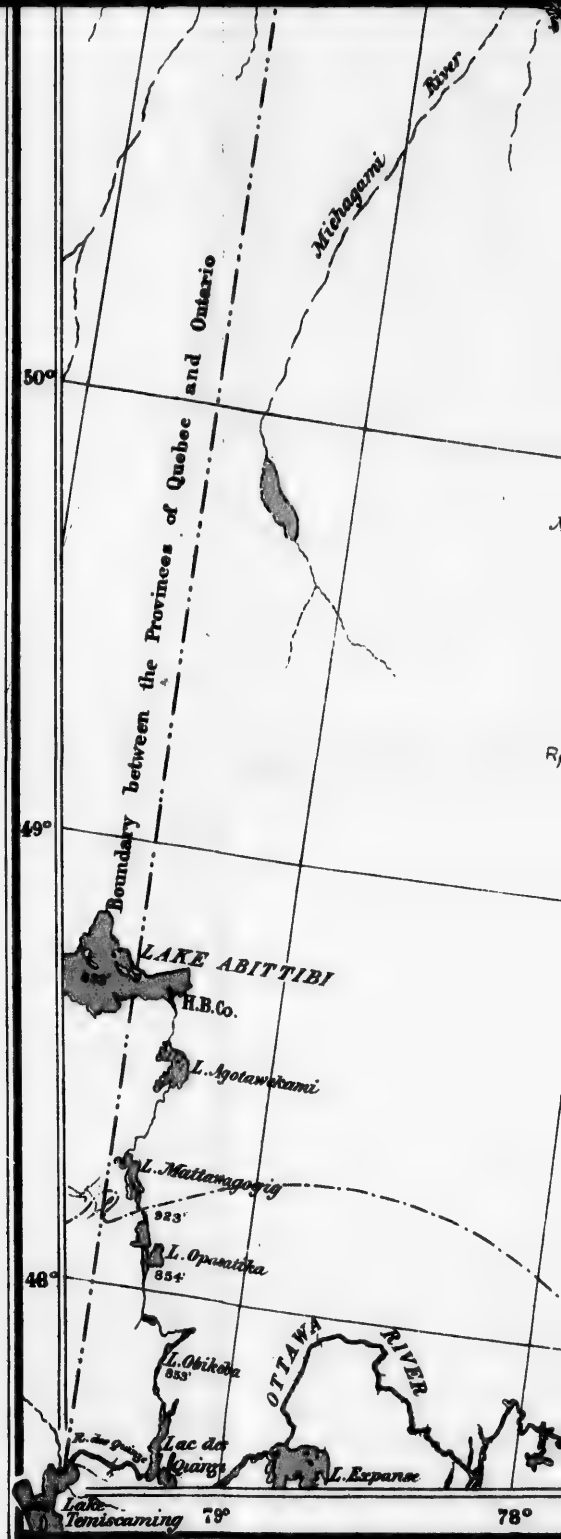
Limestone



Glacial striae

1129'

Height above sea



Compiled by D. I. V. Eaton, C.E.
 Drawn for photo-lithography by C. O. Sénécal, C.E.

Coast line
 (1)
 (2)
 by A. I.
 River
 survey
 Manicouagan
 are from
 (1845).



C.E.
by G. O. Senécal, C.E.

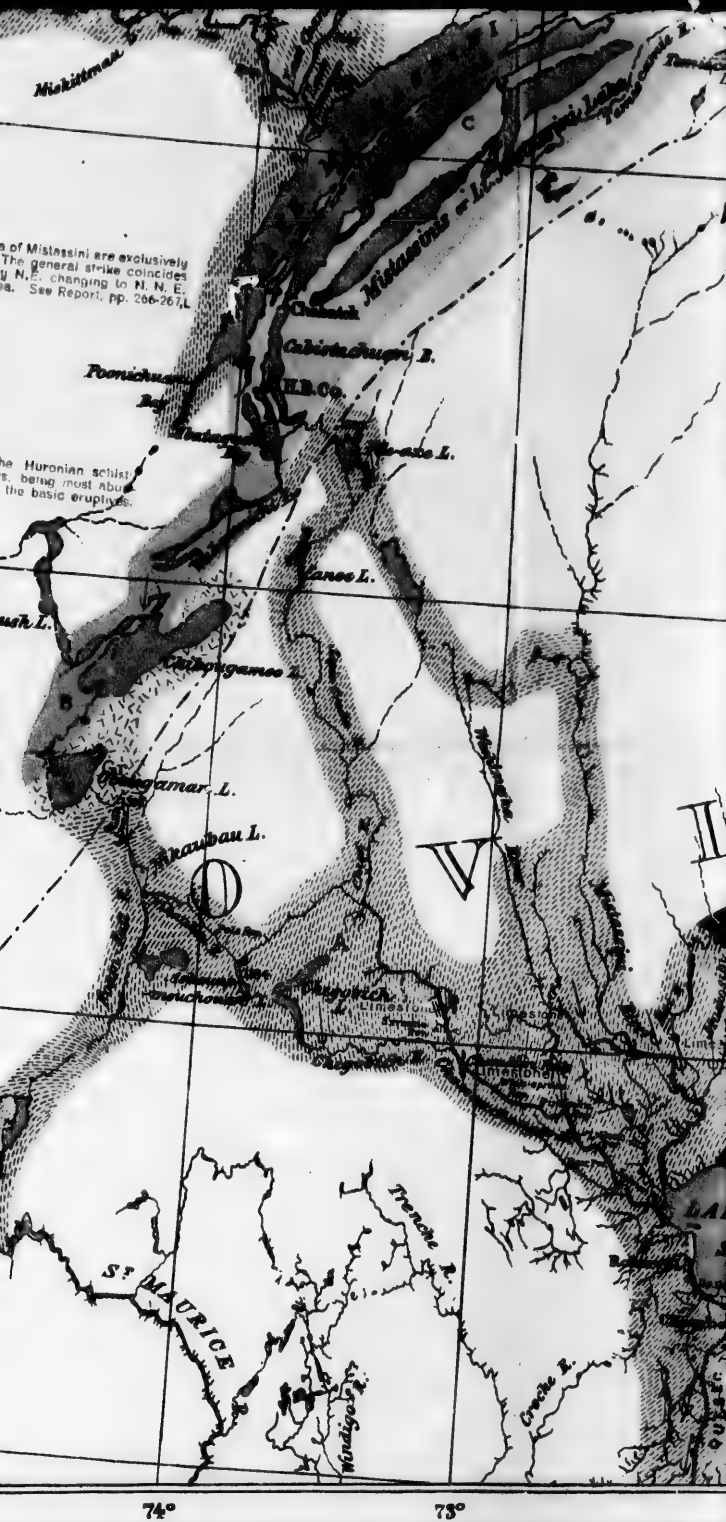
SOURCES OF INFORMATION. GEOGRAPHICAL.

Coast line from various Admiralty Charts excepting:

- (1) East coast of Hudson Bay between Portland Promontory and Great Whale River, from map by Dr. R. Bell, 1877-78.
- (2) Coast and islands of James Bay from charts of Capts. Taylor and Bishop, of the H. B. Co's vessels, with corrections by A. P. Low, 1889.

Rivers of the southern watershed chiefly from surveys of the Department of Crown Lands, Quebec. Nottaway River from survey by R. Bell, 1895, Rupert, East Main, Koksoak, Hamilton, Romaine and portions of the Big, Great Whale, Clearwater, Manicougan and North-west rivers, from surveys by A. P. Low and D. I. V. Eaton. Rivers and lakes shown in dotted lines are from sketch-maps of H. B. Co. The central interior from a map made by John Spencer and John Beads at Nichicun (1842). The routes between the East Main and Nottaway rivers from a map compiled by Jas. Clouston (1844).

0 5 10 15 20 25



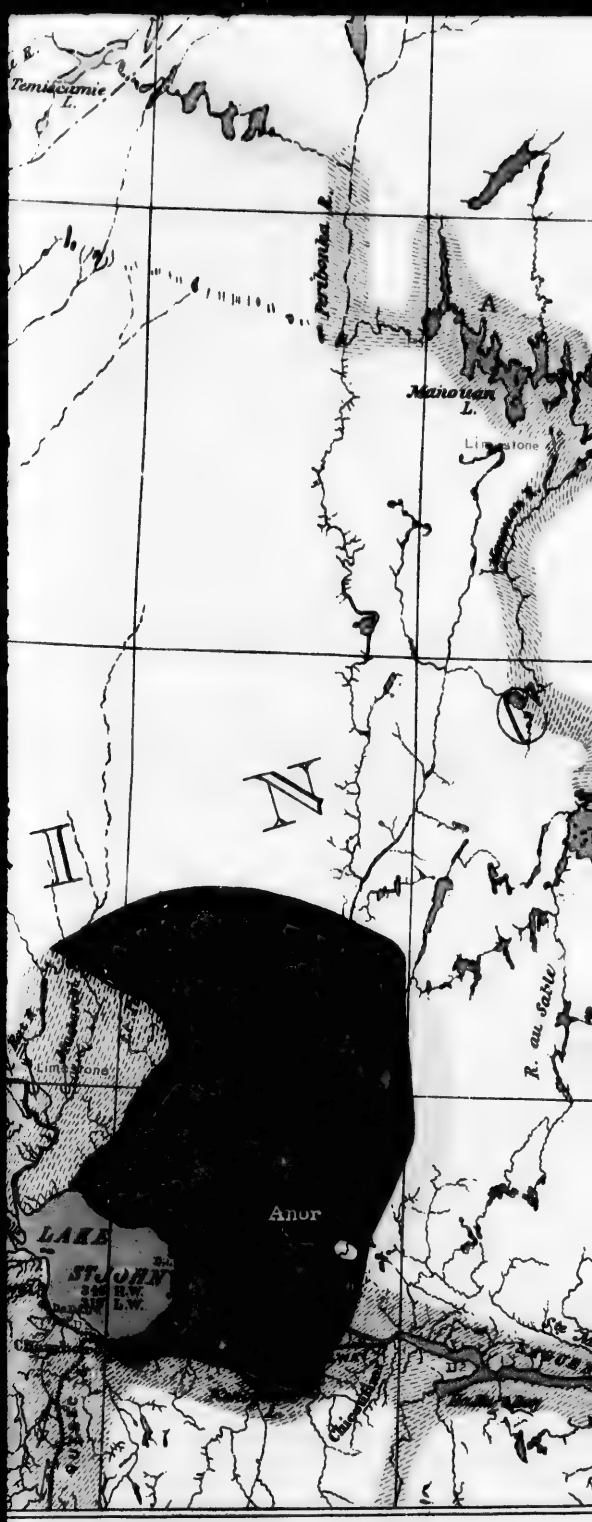
South West Sheet

MAP — of — LABRADOR PENINSULA

Natural Scale:

Scale: 25 miles to one inch

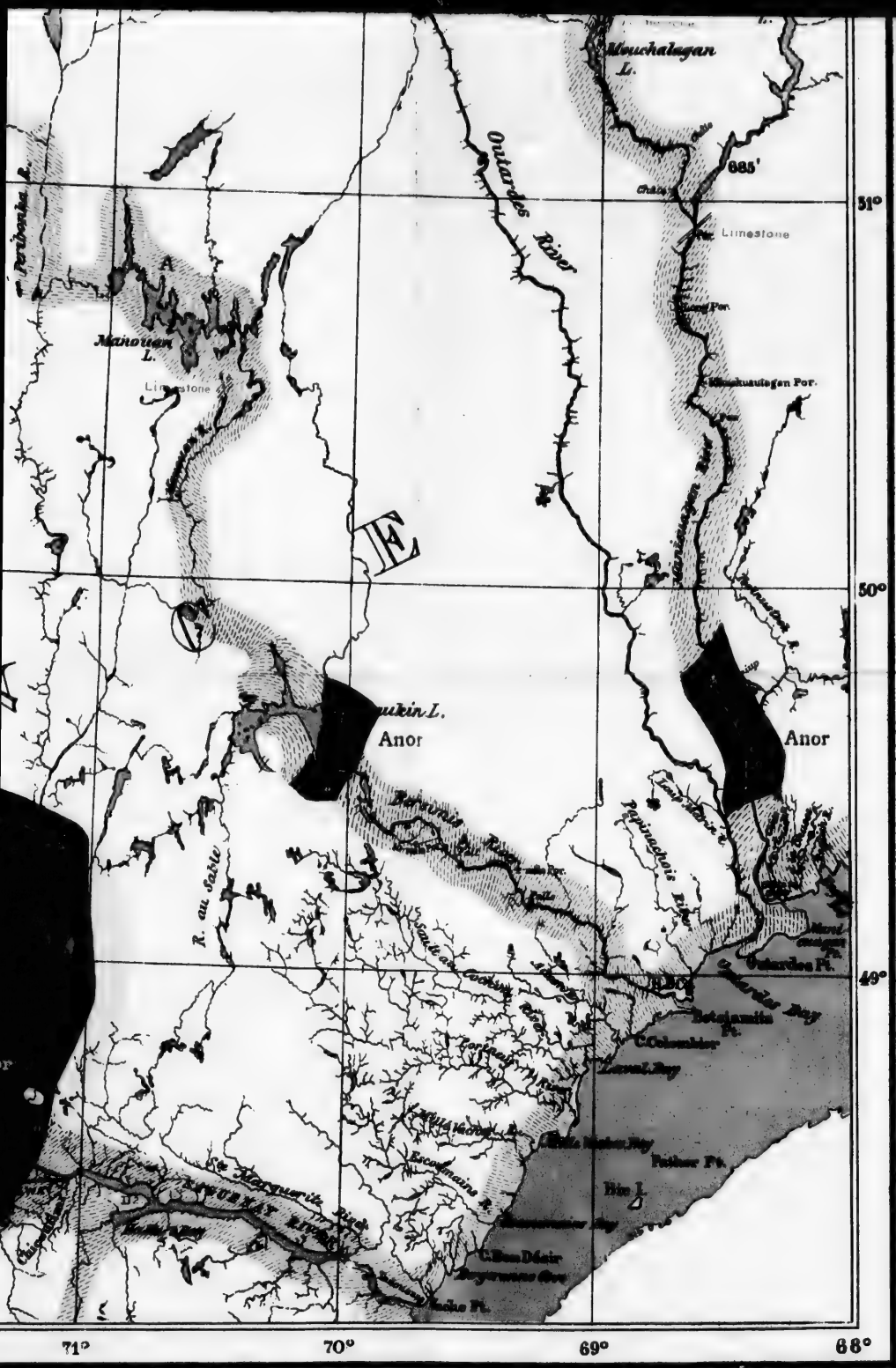
The geology
(1) Fa
(2) Ob
(p. 19, L.)
(3) Ob



SOURCES OF INFORMATION. GEOLOGICAL.

The geological indications include:

- (1) Facts obtained during A. P. Low's expeditions of 1892, '93, '94, '95 and '96.
- (2) Observations contained in previous reports of the Geological Survey as enumerated (p. 19, L.), including work by J. Richardson, W. McQuest, R. Bell and F. D. Adams.
- (3) Observations of A. S. Packard on the coast between Belle Isle and Nain.



Accompanying Report by A. P. Low, B. A. Sc., Part I, Vol. VIII, (New Series)

**SOURCES OF INFORMATION.
GEOLOGICAL.**

editions of 1892, '93, '94, '95 and '96.
ports of the Geological Survey as enumerated in the accompanying report
W. McQuest, R. Bell and F. D. Adams.
coast between Belle Isle and Nain.



G.E.
by C. O. Senécal G.E.

SOURCES OF INFORMATION GEOGRAPHICAL

Coast line from various Admiralty Charts excepting :

- (1) East coast of Hudson Bay between Portland Promontory and Great Whale River, from map by Dr. R. Bell, 1877-78.
- (2) Coast and islands of James Bay from charts of Capts. Taylor and Bishop, of the H. B. Co's vessels, with corrections by A. P. Low, 1887.

Rivers of the southern watershed chiefly from surveys of the Department of Crown Lands, Quebec. Nottaway River from survey by R. Bell, 1895, Rupert, East Main, Koksoak, Hamilton, Romaine and portions of the Big, Great Whale, Clearwater, Manicougan and North-west rivers, from surveys by A. P. Low and D. I. V. Eaton. Rivers and lakes shown in dotted lines are from sketch-maps of H. B. Co. The central interior from a map made by John Spencer and John Beads at Nichicun (1849). The routes between the East Main and Nottaway rivers from a map compiled by Jas. Clouston (1824).

5 0 5 10 15 20

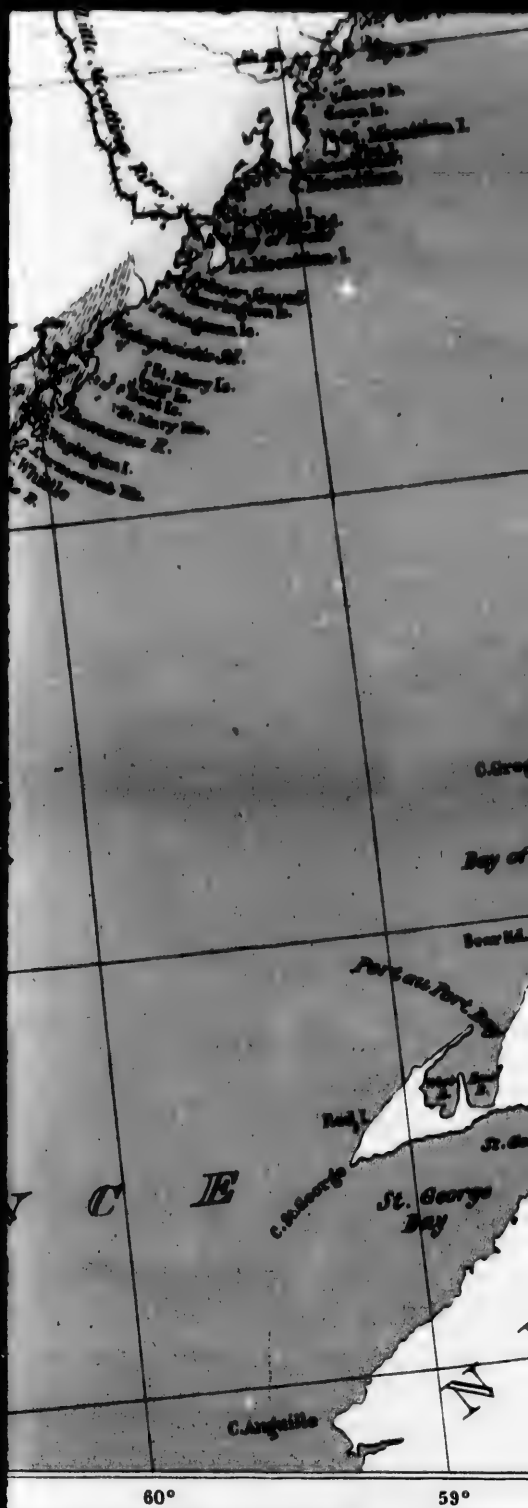
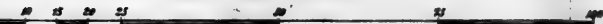


South East Sheet

MAP
— of —
LABRADOR PENINSULA

Natural Scale: ~~1:1000~~

Scale: 25 miles to one inch.



SOURCES OF INFORMATION GEOLOGICAL

The geol.
(1) F
(2) U
(p. 19, 1.
(3) O

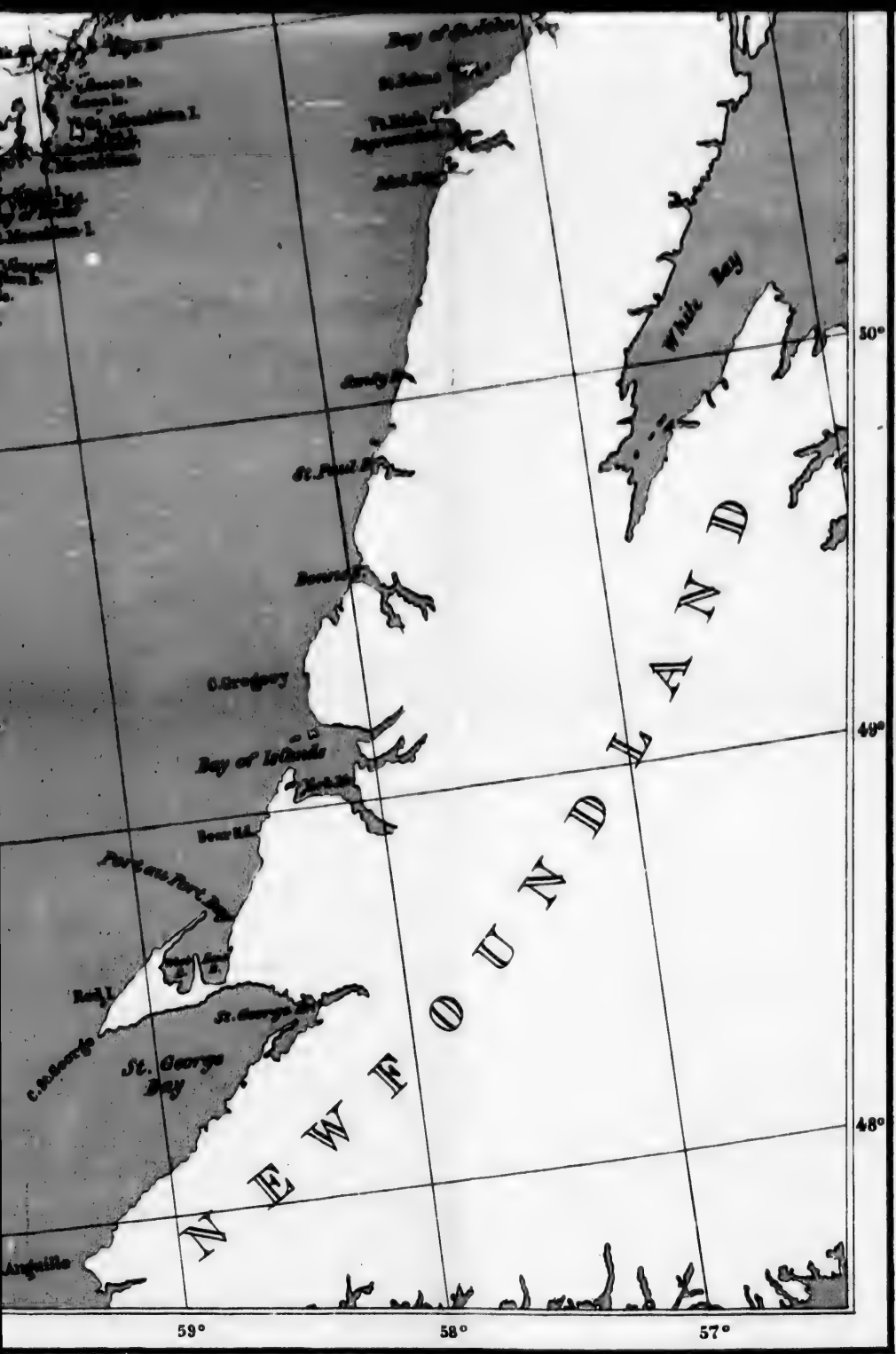
biological indications include:

Facts obtained during A. P. Low's expeditions of 1892, '93, '94, '95 and '96.

Observations contained in previous reports of the Geological Survey are enumerated

...), including work by J. Richardson, W. McQuat, R. Bell and F. D. Adams.

Observations of A. S. Packard on the coast between Belle Isle and Nain.



Accompanying Report by A. P. Low, B. Ap. Sc., Part L, Vol. VIII, (New Series)

**SOURCES OF INFORMATION
GEOLOGICAL**

Expeditions of 1892, '93, '94, '95 and '96.
Reports of the Geological Survey as enumerated in the accompanying report
by W. McCoust, R. Bell and F. D. Adams.
The coast between Belle Isle and Nain.

587

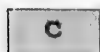
LABRADOR PENINSULA.

North-West Sheet.

Legend



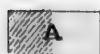
Cambro-Silurian



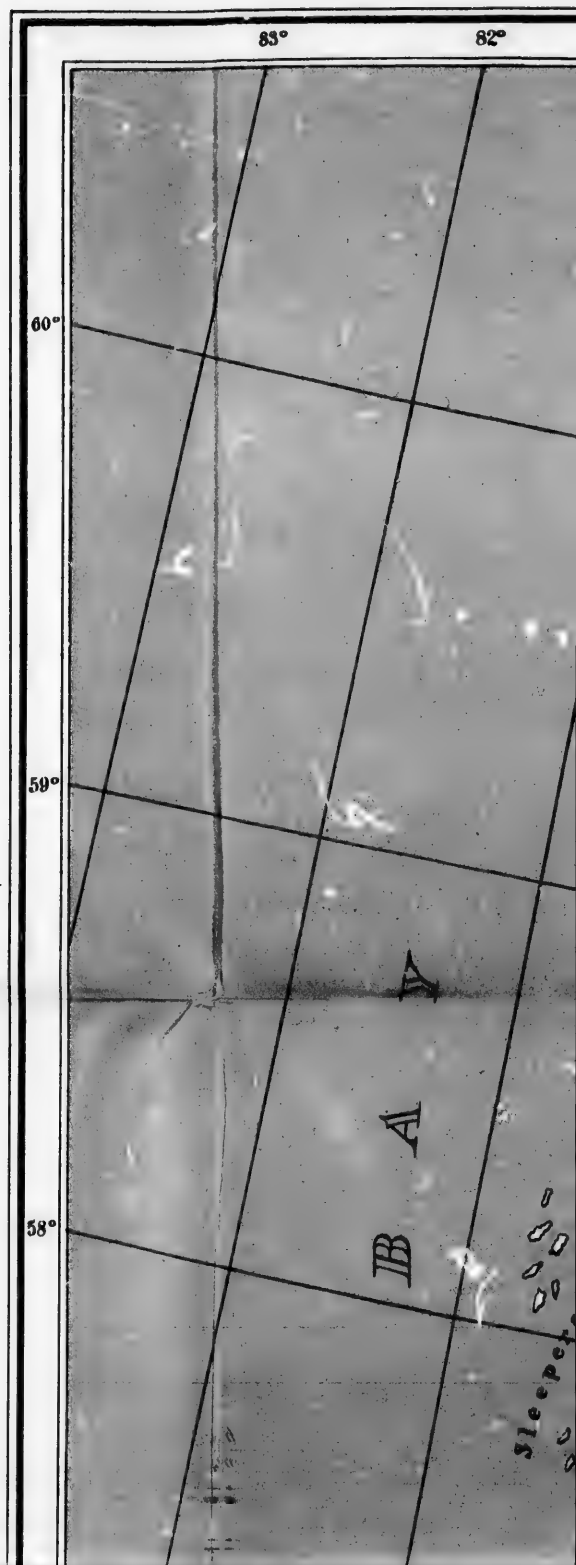
Cambrian



Huronian



Laurentian; including Fundamental Gneisses and Grenville Series, sometimes with limestones





Geological Survey of Canada

GEORGE M. DAWSON, C.M.G., LL.D., F.R.S. &c., DIRECTOR

1898

77° 76° 75° 74°

Ottawa Islands consist of Cambrian
ruptives. See Annual Report 1885, p.

U n e x p l o r

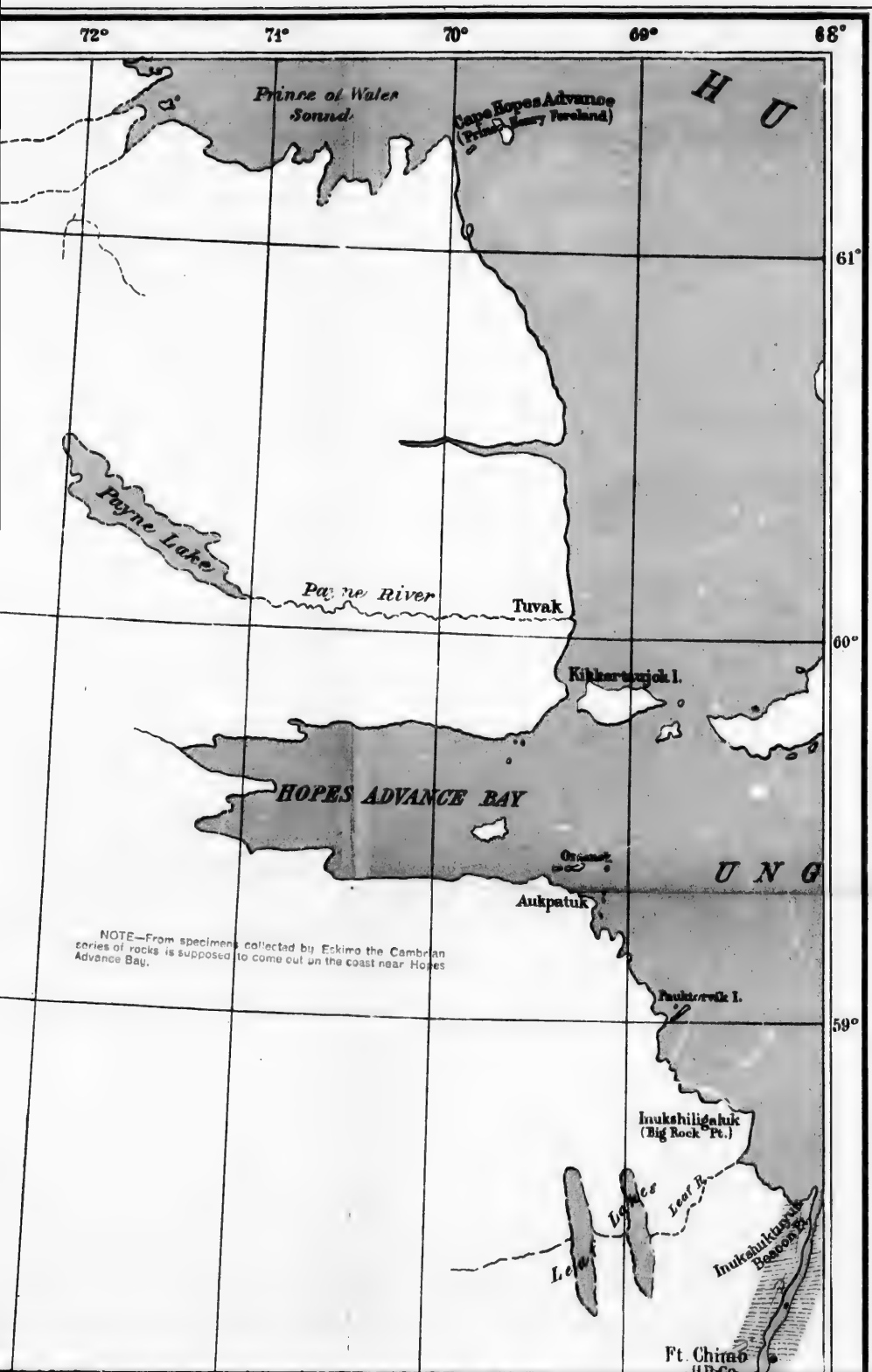
along shore, north.

73° 72°



NOTE—From specimens of
series of rocks is supposed to
Advance Bay.

e d



588

LABRADOR PENINSULA.

North-East Sheet

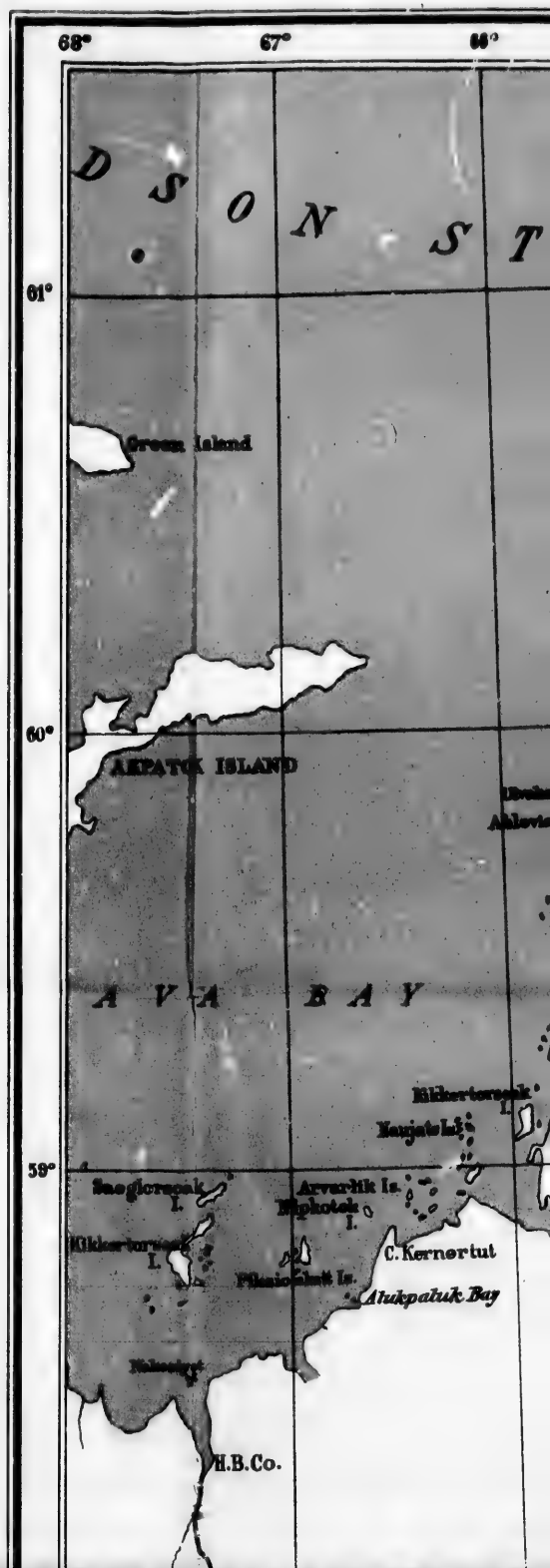
Cambro-Silurian

Cambro-Silurian

Cambrian

Huronian

Laurentian; including fundamental Gneisses and Grenville Series, sometimes with limestones.



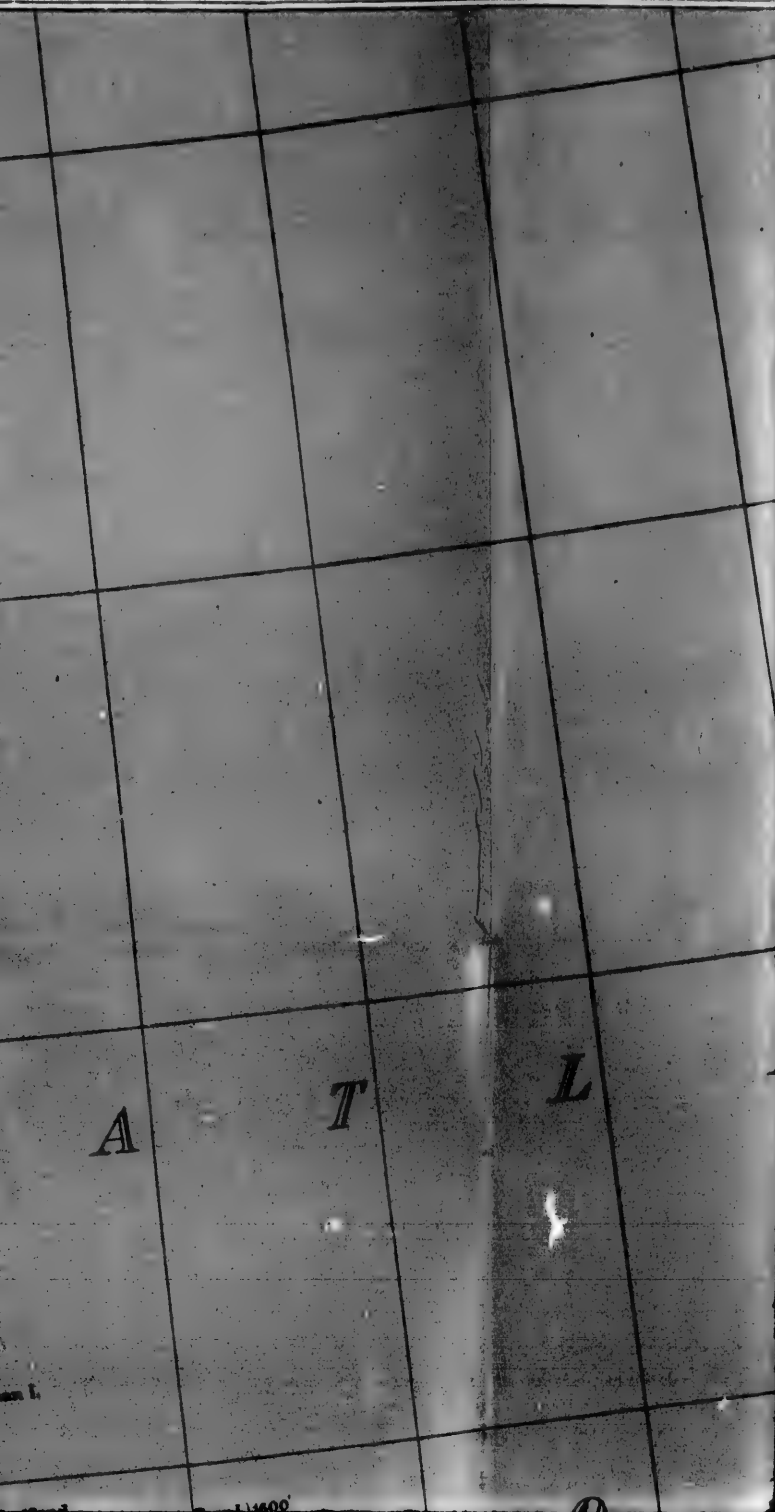


Geological Survey of Canada

GEORGE M. DAWSON, C.M.G., LL.D., F.R.S. &c., DIRECTOR

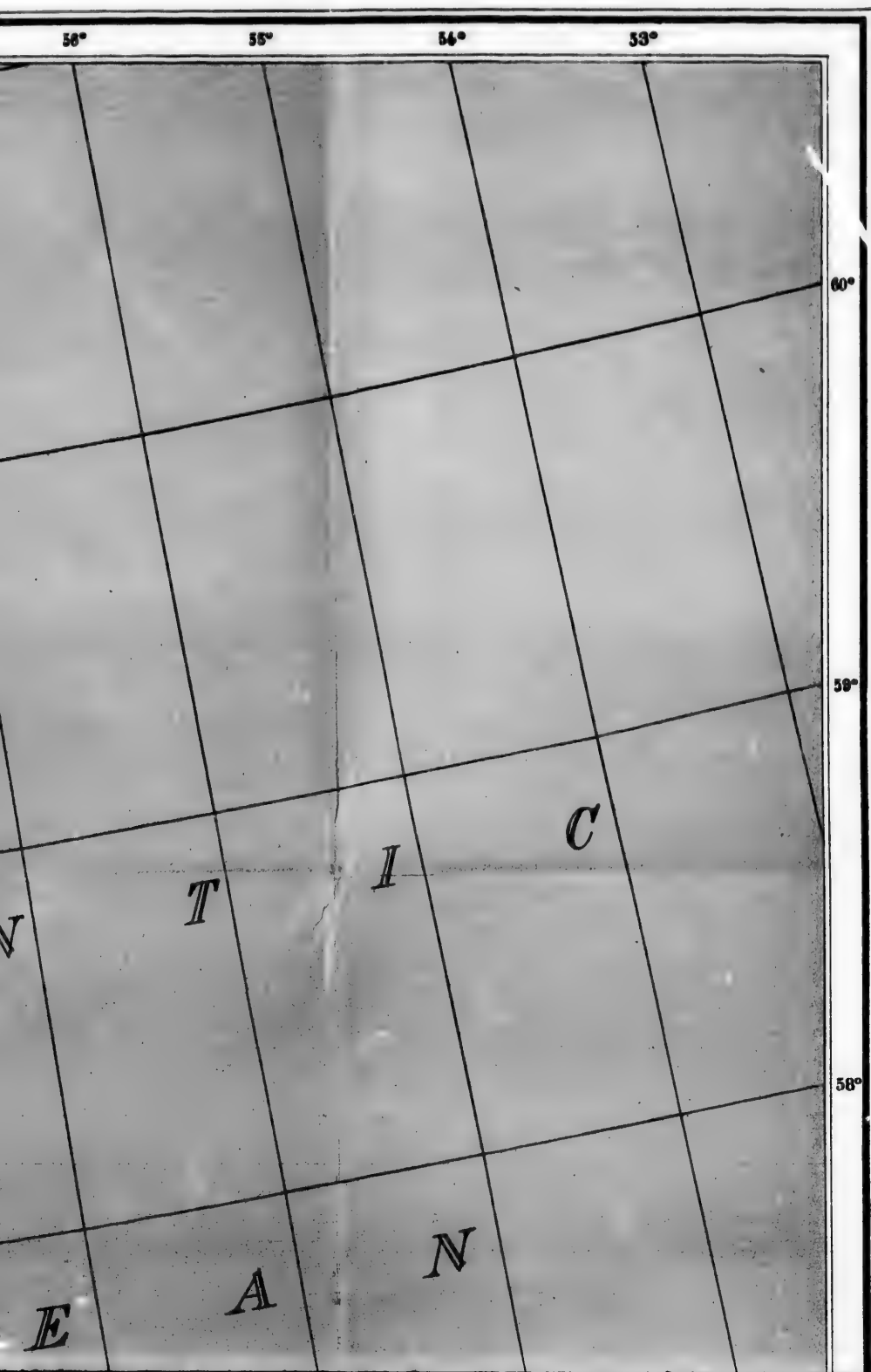
1894

61° 60° 59° 58°



57° 58°







Massive granitic rocks



Anorthosites



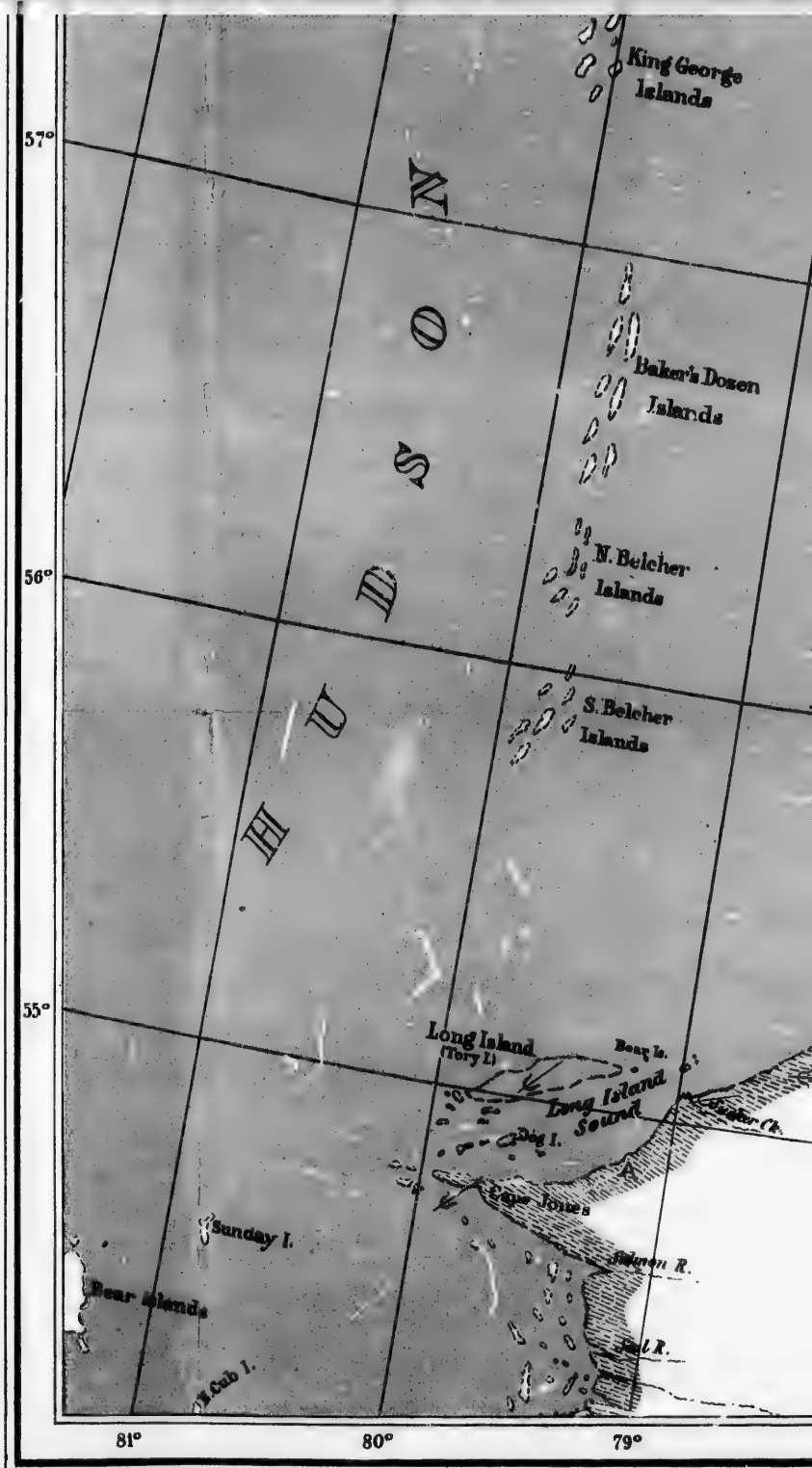
Limestone



Glacial striae

1129'

Height above sea



Compiled by D. I. V. Euton, C.E.

Drawn for photo-lithography by C. O. Senécal, C.E.

SOU

Coast line from various Admiralty Charts excepting

(1) East coast of Hudson Bay between Portland

(2) Coast and islands of James Bay from chart by A. P. Low, 1857.

Rivers of the southern watershed chiefly from survey by R. Bell, 1895, Rupert, East Main, Kokso Manicougan and North-west rivers, from surveys by H. B. Co. The central (1842). The routes between the East Main and



**SOURCES OF INFORMATION.
GEOGRAPHICAL.**

Charts excepting :
 Bay between Portland Promontory and Great Whale River, from map by Dr. R. Bell, 1877-78.
 James Bay from charts of Capts. Taylor and Bishop, of the H. B. Co's vessels, with corrections
 watershed chiefly from surveys of the Department of Crown Lands, Quebec. Nottaway River from
 East Main, Koksoak, Hamilton, Romaine and portions of the Big, Great Whale, Clearwater,
 rivers, from surveys by A. P. Low and D. I. V. Eaton. Rivers and lakes shown in dotted lines
 B. Co. The central interior from a map made by John Spencer and John Beads at Nicholson
 the East Main and Nottaway rivers from a map compiled by Jas. Clouston (1884).

North West Sheet.

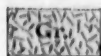
**MAP
— of —
LABRADOR PENINSULA.**

Natural Scale: $\frac{1}{100000}$.

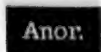
Scale: 25 miles to one inch.



The geological in-
 (1) Facts obt
 (2) Observati
 (p. 19, L.) includ
 (3) Observati



Massive granitic rocks



Anorthosites



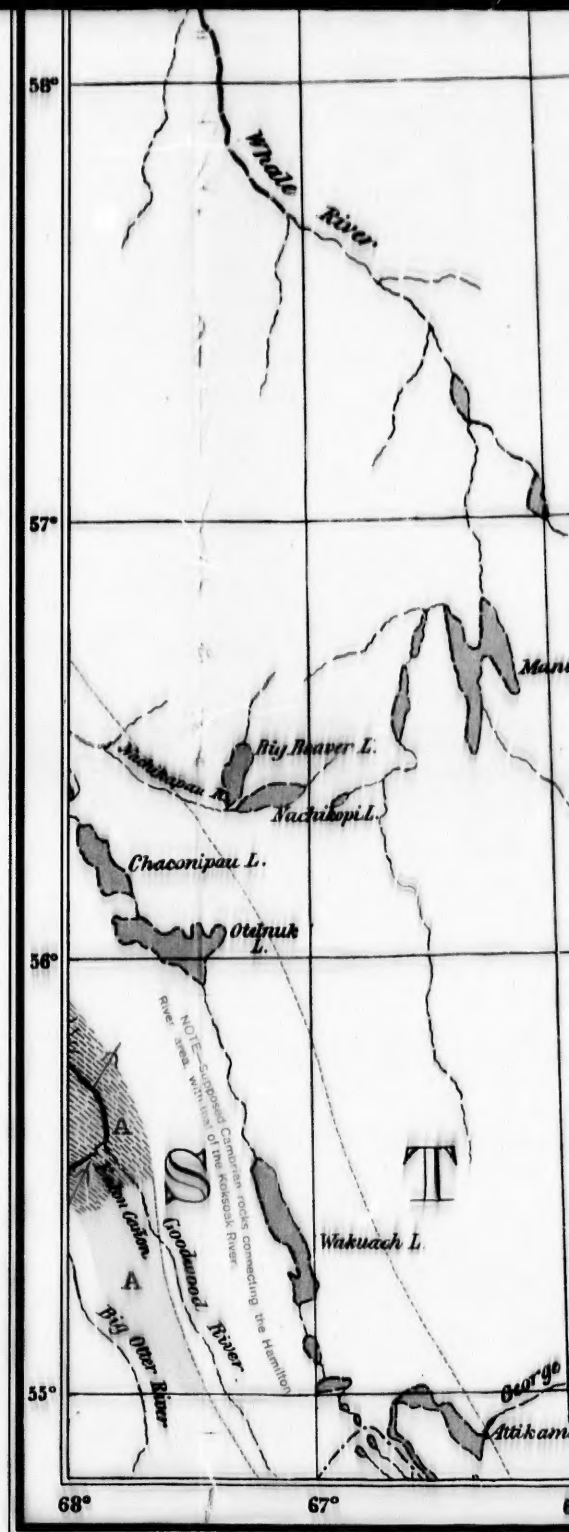
Limestone



Glacial striae

1129'

Height above sea



Compiled by D. I. V. Eaton, C.E.
Drawn for photo-lithography by C. O. Senécal, C.E.

Coast li
(1)
(2)
by A. I.
Riv
survey
Manicu
are from
(1842).



E.
by C. O. Sénécal, C.E.

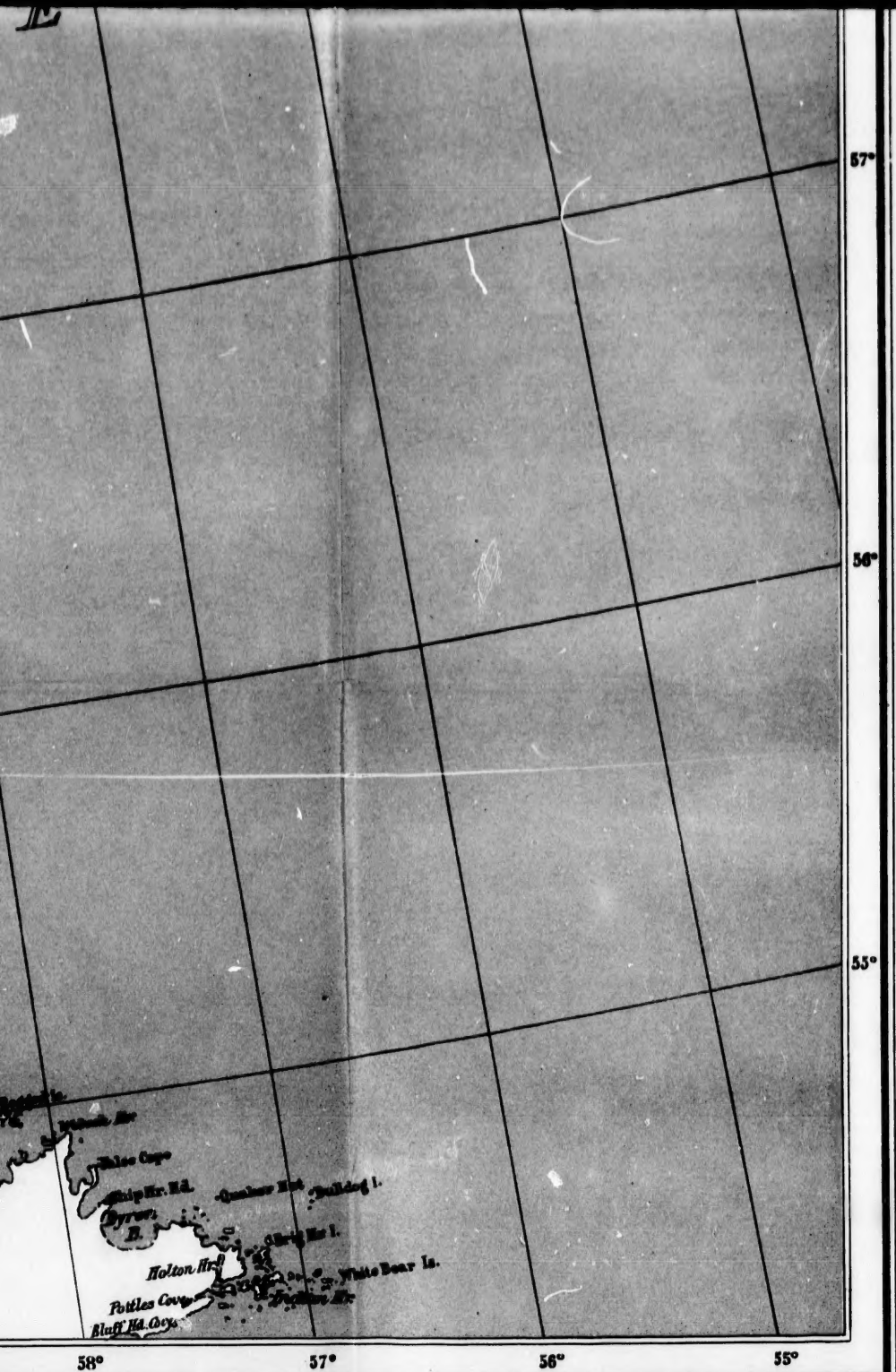
SOURCES OF INFORMATION GEOGRAPHICAL

Coast line from various Admiralty Charts excepting:

- (1) East coast of Hudson Bay between Portland Promontory and Great Whale River, from map by Dr. R. Bell, 1877-78.
- (2) Coast and islands of James Bay from charts of Capts. Taylor and Bishop, of the H. B. Co's vessels, with corrections by A. P. Low, 1887.

Rivers of the southern watershed chiefly from surveys of the Department of Crown Lands, Quebec. Nottaway River from survey by R. Bell, 1895, Rupert, East Main, Koksoak, Hamilton, Romaine and portions of the Big, Great Whale, Clearwater, Manicougan and North-west rivers, from surveys by A. P. Low and D. I. V. Eaton. Rivers and lakes shown in dotted lines are from sketch-maps of H. B. Co. The central interior from a map made by John Spencer and John Bends at Nicholson (1842). The routes between the East Main and Nottaway rivers from a map compiled by Jas. Clouston (1824).

1 0 5 10 15 20



Accompanying Report by A. P. Low, B. A. Sc., Part I, Vol. VIII, (New Series.)

SOURCES OF INFORMATION
GEOLOGICAL

588

editions of 1892, '93, '94, '95 and '96.
ports of the Geological Survey as enumerated in the accompanying report
V. McQuat, R. Bell and F. D. Adams.
coast between Belle Isle and Nain.